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ABSTRACT

A report is presented of a study regarding needed facilities at public institutions of higher education in New Jersey. Principal findings and conclusions are summarized and recommendations made. Key parts of the study are described, beginning with a review of the present status of New Jersey higher education. Further details and supporting statistical material are included in exhibits and appendices that follow the text of the report. (FS)

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A PLAN FOR MEETING NEW JERSEY COLLEGE AND UNIVERSITY FACILITIES NEEDS THROUGH 1980

NEW JERSEY STATE COMMISSION FOR
THE HIGHER EDUCATION FACILITIES ACT OF 1963

August 1968

EF 004 135

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ROBERT HELLER ASSOCIATES, INC.
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CLEVELAND, NEW YORK, NEWARK

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Dr. Albert E. Meder, Jr., Chairman
New Jersey State Commission for the
Higher Education Facilities Act of 1963
225 West State Street
Trenton, New Jersey 08625

Dear Dr. Meder:

We are pleased to submit our report of the work done to determine facilities needs of the New Jersey colleges and universities to meet enrollment demand through 1975 to 1980.

We conclude that demand for undergraduate places by New Jersey residents, now at 140,000, will rise 57% to 220,000 in the 1975-to-1980 period. This will result both from an increase in population and the aspiration of a larger proportion of New Jersey youth to attend college.

To meet the need of this next wave of New Jersey youth for higher education at reasonable cost we recommend that the State more than double the undergraduate capacity of its public colleges and university between now and 1975. The undergraduate enrollment of New Jersey residents in New Jersey private institutions should increase more moderately. These increases in in-state capacity and enrollment will reduce the proportion of New Jersey residents attending out-of-state institutions, which is now at an excessively high level.

The number of full-time students enrolled in New Jersey graduate and professional schools should be increased 150% to about 16,000 in the 1975-1980 period, 11,000 of these in public colleges and universities and 5,000 in private institutions.

The cost of providing the needed facilities at the public institutions - both to accommodate enrollment growth and overcome present deficiencies in physical plant - will be high. We estimate that $473 million in State funds will be required in addition to that which can be obtained from the federal government and other sources.

The capital needs of the State's private colleges and universities will be far less and can probably be met through federal and private sources. However, the private institutions will have increasing difficulties in meeting operating costs, and consideration should be given by the State to providing some form of operating assistance to them.

It is clear that a massive effort by the State is required in the next few years if New Jersey is to meet its responsibilities for providing higher educational opportunity to its citizens.

In carrying out this assignment we worked closely with a great many individuals and groups throughout the State and we are most appreciative of the excellent cooperation that was received.

The members of the Commission gave untiringly of their time and counsel, and a particular debt is owed to the Executive Secretary. Heavy demands were placed on administrative officers of the State's colleges and universities in gathering together needed data. The counsel of members of the Board of Higher Education and the Department of Higher Education was invaluable.

It has been a pleasure to work with the Commission and we hope that you will feel free to call on us for any further interpretation of our findings and conclusions.

Very truly yours

Warren R Dix

Warren R. Dix
Executive Vice President

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I. INTRODUCTION

The work that led to this report was commissioned in June, 1967, by the New Jersey State Commission for the Higher Education Facilities Act of 1963. Work began on 10 July 1967 to analyze State-wide enrollment demand and determine college and university facilities requirements through 1980. Funds were provided by the United States Office of Education in recognition of the importance of comprehensive planning in determining allocations for educational building programs.

This work is also intended to have value to the Department of Higher Education in its development of master plans for higher education in New Jersey.

As work went forward on this project numerous meetings to report progress were held with the Commission, the Department, the Board of Higher Education, and their individual members. Information provided at these meetings has already been put to use and some has been published. The report of the Governor's Commission to Evaluate the Capital Needs of New Jersey and the May, 1968, report "Higher Education in New Jersey : A Facilities Plan" contain much factual information developed during this study.

In some cases minor differences will appear because of adjustments made in the Heller data after preliminary figures were furnished to others. These small differences do not affect basic conclusions.

In carrying out this work, previous studies of New Jersey higher educational needs were analyzed, including the Newsom report of 1964, the Strayer report of 1962, revised Strayer report of 1965, The Citizens Committee for Higher Education in New Jersey report of 1966, and others. Although the projections of enrollment demand vary somewhat, this report and the earlier ones agree on the fundamental point - that the State of New Jersey lags in higher education and must do far more in the years ahead than it has in the past to enlarge its colleges and universities.

Although this report emphasizes the quantitative aspects of enrollment and facilities requirements it is equally important that New Jersey colleges and universities maintain high standards in both academic programs and physical facilities. New Jersey colleges and universities need to stand high in the competition for the better students.

Principal findings and conclusions are summarized in the next section of the report, followed by recommendations. Later sections describe key parts of the work, beginning with a review of the present status of New Jersey higher education. Further details and supporting statistical material are included in exhibits and appendixes that follow the text of the report.

Certain special studies requested by the Commission during the course of the project are also described briefly.

II. SUMMARY

Many previous studies of higher educational needs in New Jersey have pointed out the State's deficiencies in higher educational facilities and its need to accommodate a greater proportion of New Jersey residents in in-state colleges and universities. These earlier findings are confirmed by work done on this assignment. The New Jersey public colleges and universities in particular will need to embark on a major expansion program, both to overcome past deficiencies and to meet the future increased demand for places in college.

In the 1967-1968 academic year about 140,000 New Jersey residents were enrolled as undergraduates in colleges and universities throughout the United States. Slightly more than half of these - 75,000 - attended institutions outside of New Jersey. About 41,000, or 29%, attended in-state public institutions, and the remaining 24,000, or 17%, attended in-state private colleges and universities. Although the total number of New Jersey residents enrolled in college as full-time undergraduates has increased significantly over the past years, up from 97,000 as recently as 1963, the respective proportions attending in-state private and public institutions and going out of state have remained fairly stable.

Forecast: 220,000 Full-Time Undergraduates

As a result of population growth and an increase in the percentage of population attending college, it is projected that the number of New

Jersey residents attending college as full-time undergraduates will increase from the present 140,000 to about 220,000 in the 1975 to 1980 period.

During the 1980 to 1985 period, the number of full-time undergraduate students is projected to level off at about 250,000. A forecast decline in college-age population during 1980 to 1985 will be about equally offset by a continuing increase in the percentage of college-age population actually attending college.

For planning purposes the figure of 220,000 full-time undergraduates has been selected as the enrollment demand the State should prepare for. This number of undergraduates may be reached as early as 1975 or as late as 1980, depending to a certain extent on the speed with which the State provides additional college facilities. College attendance patterns are influenced by such external factors as rising income levels and increased emphasis on higher education by society, and also by the availability of places in college.

Growth from 140,000 undergraduates in 1967 to 220,000 in 1975-1980 represents a 57% increase. Of the 80,000 additional full-time undergraduate students, slightly more than half - 43,000 - will result from the projected population increase in New Jersey and the other 37,000 will result from an increase in the proportion of New Jersey residents attending college, that is, an increased "aspiration level".

If New Jersey high school graduates are ranked by academic ability level, it is found that currently about 80% of those in the upper two-fifths in academic ability level enter college. By contrast, in the bottom three-fifths only about 28% of the high school graduates go on to college. By the 1975-1980 period a much higher percentage, estimated at 43%, of the less qualified students will enter college. Much of the increase in college attendance will come from those students about in the middle and fourth quintile of academic rank.

To accommodate this large number of new students who will be seeking higher education, it will be necessary that the State substantially increase the capacity of its public institutions. The 28% of New Jersey's undergraduate students who attend in-state public institutions compares with an over-all average for the United States of 57%. The remaining 72% of New Jersey undergraduates attend higher-cost private and out-of-state institutions. One result of this is a high average college attendance cost for New Jersey residents - $934 in 1966 for tuition and fees as compared to a national average of $542.

New Jersey and its residents are handicapped in other important respects by the limited capacity of the State's public colleges and universities. Many applicants are rejected who in other states would be qualified for admittance to the public colleges and universities. In 1966 Rutgers rejected a total of 4,000 applicants which it considered qualified for admittance to the university but for which there was no room. Similarly, in 1966 the six State colleges rejected a total number of 5,200, of which 49% were in the top half of their high school graduating classes. In most other states they would have been regarded as qualified for admittance to a state college.

In addition to the limited number of places available in the New Jersey public institutions, the academic programs are restricted in that an unusually high percentage of places are available only to students oriented toward becoming school teachers. Currently 53% of the bachelor's degree recipients from New Jersey public institutions are prepared for teacher certification, compared to a national average of 35%.

A further consequence of the limited capacity of the New Jersey public institutions is their inability to attract or accept significant numbers of students from other states. Most colleges consider it good policy to accept a reasonable percentage of out-of-state students, and for public institutions in the United States as a whole the average figure is 12%. In New Jersey only 4% of the students in public institutions come from outside the State.

Recommended Enrollment Capacity of Public Institutions

Future requirements in enrollment capacity were examined for each of the major public segments - the State colleges, county colleges, Rutgers, and the Newark College of Engineering.

Enrollment at the six State colleges in the 1967-1968 academic year was 21,000. Had all the "qualified" applicants been accepted, enrollment would have been approximately 28,500. If this figure were increased 57% in accordance with the over-all increase in demand for college places by New Jersey residents, the State colleges would have an enrollment capacity of approximately 45,000 in the 1975-1980 period. This is one method of arriving at the general enrollment capacity level that should be achieved.

Further analysis was made by examining the enrollment goals of each State college and the rates at which they could be reasonably expected to expand. A figure of 42,800 full-time undergraduate students was selected as a reasonable goal for capacity of the State colleges in the 1975-1980 period. This includes the six existing State colleges and two new colleges needed to accommodate the demand. One new college should be located in the northern part of the State and the other in the southern part.

Throughout the United States great emphasis is being placed on the development of two-year community colleges as a means of meeting the higher educational needs of large numbers of students at relatively low cost. In Florida and California, two-year community colleges now enroll more than 43% of the states' college-going residents. In 1975, total enrollment in two-year colleges throughout the United States is projected to represent about 19% of total undergraduate enrollment. The five county colleges in New Jersey which have been operational for a few years now enroll more than 16% of the total college-going residents of their counties.

It is recommended that plans be made to have the county colleges accommodate about 20% of the State's total undergraduates in the 1975-1980 period. This would result in enrollment of about 42,000 students, the figure that has been used for planning purposes.

It is recommended that Rutgers be expanded in the 1975-1980 period to accommodate 20,800 undergraduate New Jersey residents. This would result in a slight increase from the present 8.6% of the State's undergraduates attending Rutgers to approximately 9.5%.

Newark College of Engineering should be expanded from its present 2,600 to 3,400 in the target period. This would result in a reduction in NCE's total share of undergraduates from 1.9% to 1.5%, in keeping with trends in engineering education and with NCE's own objectives.

Achievement of these enrollment goals for the State public institutions would provide places for approximately 109,000 New Jersey residents in the 1975 to 1980 period. This is an ambitious plan but it is strongly recommended that the State implement measures necessary to accomplish it. The result would be to increase the percentage of New Jersey residents enrolled as undergraduates in State public institutions from today's very low figure of 28% to 49%.

New Jersey would still be below the national average which in 1975-1980 is expected to exceed 60%, but would have gone a long way toward meeting its responsibilities to its citizens for quality, low-cost higher education.

Attendance Patterns - New Jersey Private and Out-of-State Institutions

The remainder of the New Jersey residents in the 1975-1980 period who will attend college as undergraduates will be accommodated in the State's private institutions and in out-of-state colleges. This total is projected to be slightly more than half of the total undergraduates, or about 111,000.

For some time the high number of New Jersey residents attending out-of-state colleges has been a matter of concern to educational, business, and civic leaders in the State. Approximately 75,000 New Jersey residents attended colleges out of the state in the 1967-1968 year. About 75% of these attended out-of-state private colleges and the remaining 25% attended public institutions. Slightly more than half were enrolled in colleges in Pennsylvania, New York, and the New England states. About a fourth attended colleges in metropolitan Philadelphia and New York City, half of these as commuters.

The extent to which these outmigrants leave the State voluntarily, as against how many of them would have preferred to attend college in New Jersey, was investigated. Results indicated that about 25% of the current outmigrants would have preferred to attend college within the State. This estimate was made by analyzing the types of institutions attended (in which it was found that about two-thirds of the outmigrants attend institutions rated "competitive"), by analyzing information obtained about the rejected students of Rutgers and the State colleges who attended out-of-state institutions (15% of the total outmigrants), and by a survey made of all high school guidance counselors within the State. Thus it was concluded that about 19,000 of today's outmigrants may be considered "involuntary force-outs" and should in the future be accommodated in New Jersey public institutions.

An important factor in considering the number of New Jersey outmigrants is the possibility that a saturation point may exist in the ability or willingness of out-of-state institutions to accept an increasing number of New Jersey residents. A special survey was made by RHA of more than 100 colleges that accept large numbers of the New Jersey residents. In general the private institutions showed a willingness to continue to accept New Jersey residents, whereas some of the public institutions indicated that additional restrictions might be placed on admittance of non-residents, due to their need to accommodate increasing numbers of their own state residents.

Projected growth rates of both the out-of-state public and private institutions were analyzed and it is the judgment of RHA that if the number of New Jersey outmigrant students rises to a level of about 100,000, the capacity of out-of-state institutions to accept them might begin to be strained. Above that level more and more New Jersey residents would have difficulty in gaining admittance to acceptable out-of-state colleges and universities. The saturation point could even be lower than 100,000 if increasing financial difficulties of out-of-state private institutions prevent the moderate growth now anticipated.

New Jersey Private Colleges and Universities

In the decade of the 1950s when college attendance of New Jersey residents increased rapidly, the private institutions in New Jersey grew more rapidly than the State's public colleges and universities. This is in distinct contrast to the national pattern in this period, during which public colleges in most states grew much more rapidly than private ones. In particular, four large private institutions in the State - Fairleigh Dickinson, Monmouth, Rider, and Seton Hall - assumed a responsibility that in other states was fulfilled by growing state colleges and universities.

The private colleges have been generally able to finance their physical plant expansion through successful fund drives and in recent years with help from the federal government. Currently, however, the private institutions in New Jersey, like private colleges throughout the United States, are facing difficulties in meeting annual operating income requirements. Tuition increases have in general not been able to keep pace with rising costs. Furthermore, the private colleges nationally as well as in New Jersey cannot expect to continue to increase tuition and remain reasonably competitive with the public institutions for students. Tuition and fee costs at New Jersey's private colleges and universities currently average about four times as much as at the State's public institutions.

It is essential that New Jersey private institutions remain strong and viable units within the State's higher educational system if the State is to meet its obligation to its citizens. It is recommended that the State give serious consideration to the needs of the private colleges for financial assistance, particularly for operating income. It is beyond the scope of this study to recommend the particular types and amounts of such assistance but it could take such forms as a direct subsidy to the colleges, a tuition subsidy to New Jersey residents attending private colleges and universities, contract college arrangements, or other means.

Patterns of Student Distribution

The New Jersey Board of Higher Education has recommended that steps be taken to keep the number of New Jersey residents attending college out of state from increasing significantly in the 1975-1980 period over the current 75,000 figure. Since it is projected that a total of about 111,000 students will then be accommodated in in-state private and out-of-state institutions, meeting this goal would call for a 50% expansion in the present enrollment of New Jersey students in New Jersey private colleges - from 24,000 to 36,000. If there is no increase in the private college enrollment of New Jersey students approximately 87,000 students will migrate out of the State in the 1975-1980 period, a figure below the currently estimated saturation point.

Actual enrollment goals of each private college will, of course, be determined by the institution itself. It is suggested that an over-all increase of about 25% in the enrollment of New Jersey residents in New Jersey private colleges would be a reasonable growth pattern. This would call for a yearly increase in enrollment of about 3%. Because of some extra capacity now in the private colleges it is judged that little additional space would be required to accommodate an additional 6,000 students, although some new physical plant additions would be required to provide balancing space and to replace old or inadequate buildings. Thus each private college can grow in keeping with its year-by-year ability to attract students.

By contrast, the much greater growth rate of the public colleges will require detailed advanced planning so that needed facilities can be coordinated with enrollment increases.

Demand by County

Total State-wide demand for undergraduate places was broken down on a county-by-county basis in order to provide guidance on the needed future capacity of each of the public institutions and to assist in projecting proper ratios between commuter and resident students. Specific recommendations are made on the size of each State public institution in the main body of this report. The county breakdown should also have value to the private institutions in that it indicates the number of students from each county for whom they will, in effect, be competing against out-of-state colleges and universities.

Special Undergraduate Fields

Special analyses were made of the future demand for undergraduate places for teachers and engineers.

Only a slight increase in demand for engineering education is projected and accordingly it is recommended that no consideration be given to establishing a new engineering college in New Jersey. Forecast increases in enrollment can easily be accommodated by fuller utilization of existing facilities in the State's private and public engineering colleges.

Over the next 10 to 15 years there will be annual increases in the number of teachers required in the State's primary and secondary schools because of increases in school-age population. However, trends in teacher retention and turnover rates are such that an actual decrease in the number of new beginning teachers needed each year is projected. Therefore it is essential that, as the State colleges expand, they broaden their program offerings and reduce the proportion of their undergraduates who are education majors. Continuance of the present pattern, as enrollment increases, will result in placing on the job market a large number of new teachers who will be unable to find positions within the State.

Graduate and Professional Education

Separate analyses were made of demand for places for graduate students in the State's colleges and universities. Whereas a primary premise in planning for undergraduate needs is that the State has a responsibility to its residents to provide places in college, in the case of graduate students the primary planning premises are different.

Graduate students are highly mobile and it is often difficult to define their state of residence. More significant criteria in planning graduate school capacity are such factors as the need of the State for trained professional personnel, the State's presumed responsibility for educating its "fair share" of the nation's graduate students, and, most important, the maintenance of proper ratios of undergraduate and graduate students at universities.

The needs of industry and the professions for highly trained personnel were examined and it was found that, in general, these needs are being met both by graduate students educated within New Jersey and those who migrate to New Jersey. Accordingly this consideration was judged not critical in projecting the demand for places in graduate and professional colleges in the State.

It is recommended that Rutgers increase its full-time graduate and professional enrollment from 2,700 in 1967 to 6,400 in the 1975-1980 period and that NCE increase from 100 to 150. These are in accord with carefully thought-out plans of the two institutions.

The State colleges currently have about 150 full-time graduate students. If these colleges are to fulfill their goal of becoming broad institutions of higher learning, their graduate programs should be sharply expanded, and it is recommended that they work toward a goal of about 4,000 full-time graduate students in the target period.

New Jersey private institutions enrolled about 3,400 full-time graduate students in 1967 and it is estimated that this can be increased to 5,000 in the 1975-1980 period.

The foregoing increases would result in a total of approximately 16,000 full-time graduate students in the State in 1975 to 1980, which would be very close to New Jersey's theoretical fair share of the national total, based on population at that time.

A separate analysis was made of the State's needs for medical and dental education and is described in Robert Heller Associates' report of 19 January 1968. The essential findings of this report are that although New Jersey's proportion of United States medical and dental college enrollment is below the State's theoretical fair share, the level of medical and dental care available to the citizens of the State is above the United States average, as measured by the number of physicians and dentists per unit of population. Expansion plans of existing New Jersey medical and dental schools will bring future enrollment close to the State's theoretical fair share. It is recommended therefore that available resources be concentrated in carrying out the expansion plans of the existing New Jersey schools and that no consideration be given at this time to establishment of a third medical or dental school.

Facilities and Capital Requirements

Based on the foregoing projections of enrollment demand, the facilities required were determined. A planning technique used was to calculate the square footage of space required on a per-student basis. This amount of space is termed a "space planning module". To develop the modules used, facilities planning standards in use in other states and at New Jersey institutions were analyzed and specific standards were selected. Based on these basic standards, the amounts and categories of space required per student were determined for various types of students. The categories of space incorporated in these analyses included classrooms, class laboratories, student research laboratories, faculty research laboratories, faculty office space, library, administrative office space, dining, lounge and recreation space, and others. Planning modules were developed for various combinations of undergraduate and graduate students, residents and commuters, and engineering, liberal arts, and education students.

Per-student space requirements, exclusive of dormitories, range from 76 net square feet for a general academic student at a county college to more than 300 net square feet for a graduate student in engineering, agriculture, or the physical sciences.

Construction costs for each type of space were then calculated by examination of actual construction costs in New Jersey and in other states. It was found that construction costs per square foot of space vary significantly in the State, being substantially higher in the northeast quadrant than in the southern part. Costs per gross square foot, including site preparation, design, construction and fixed equipment, range from less than $20 for maintenance facilities in the southern part of the State to more than $45 for research laboratories in the northeastern area.

The cost of providing the facilities to accommodate the needed enrollment capacity in 1975-1980 was determined as follows. For each public institution the enrollment mix in the 1975-1980 target period was projected. The resultant total amounts of space, by type, required to accommodate the projected enrollment were calculated. Existing facilities at each institution were inspected and those that had to be replaced in the next eight to 10 years were identified and an equivalent amount of space deducted. Existing space that will be available was subtracted from the total estimated space required in the 1975-1980 period. This indicated the amount of new space that will be needed.

The total cost of providing facilities in public colleges and universities to accommodate 109,000 New Jersey undergraduates and 11,000 graduate students in the 1975-1980 period is calculated at $737,637,000. This provides for medical and dental schools and the State's share of county college construction as well as for the State colleges, Rutgers, and Newark College of Engineering. Included in the total are basic construction costs, land and site preparation, architectural design and fixed equipment. In addition, provision was made for 5% annual inflation in building costs and 10% for contingencies.

Sources of Capital

Of the total capital requirement of $737,637,000, the State has already appropriated $71,483,000. An additional $113,100,000 has been pledged or obligated by federal government and private sources, most of this for the medical and dental schools. It is estimated that $53,271,000 worth of facilities will produce income and can be financed by self-liquidating borrowed funds. The federal government will probably provide a share of the balance required through the Higher Education Act of 1963 and other legislation and the portion of this that will be made available to public institutions in New Jersey has been very roughly estimated at $27,000,000. Additional federal funds will be allocated to private institutions in New Jersey. It is impossible to estimate these amounts precisely because of the host of uncertainties involved in predicting future federal government budget appropriations.

Deduction of the foregoing funds from the total leaves a balance of about $473,000,000 that will be required from the State if New Jersey is to meet the needs of its residents for higher education.

III. NEW JERSEY UNDERGRADUATES
RECENT HISTORY AND CURRENT SITUATION

At the beginning of the 1967-1968 academic year New Jersey institutions of higher education enrolled nearly 65,000 full-time undergraduate students. Of these, nearly 41,000 were enrolled in public colleges and universities and nearly 24,000 in independent institutions. These figures refer to New Jersey students only and do not include students from other states. An estimated 75,000 students of New Jersey origin were in college outside the State as full-time undergraduates at the beginning of the 1967-1968 academic year.

Therefore in fall, 1967, nearly 140,000 students of New Jersey origin were enrolled somewhere as full-time undergraduates. These figures are summarized in the following table, which includes students who come to New Jersey from other states:

Distribution of New Jersey Full-Time Undergraduate Students
Fall 1967

	New Jersey Students	From Other States	Total	%	Distribution U. S. Total Fall 1967
Enrolled in N. J.					
Public	40,800	1,600	42,400	56%	69%
Private	23,900	9,200	33,100	44	31
Total	64,700	10,800	75,500	100%	100%
Enrolled Outside N. J.					
Public	18,500			25%	
Private	56,500			75	
Total	75,000			100%	
Total N. J. Students	139,700				

Full-time enrollment of New Jersey students in and outside the State is summarized for the past five years in Exhibit 1. It can be seen that while total enrollment grew more than 40%, the share in each major segment remained almost unchanged. Fifty-four percent go outside the State now compared with 55% of a smaller number in 1963, indicating that colleges and universities in the State have at least kept up with the strong growth in enrollments during the past few years.

Projections of the continuing increase in enrollment demand over the next several years are taken up in the next section of the report.

IV. FORECAST OF UNDERGRADUATE ENROLLMENT DEMAND

Total New Jersey undergraduate enrollment demand is expected to reach 220,000 by 1975, up from an estimated 139,700 in 1967. The rate of growth will have begun to slow down by 1975 so that 1980 enrollment is expected to reach only 250,000, with substantially the same figure five years later.

The first step in developing the forecasts was to review earlier reports concerning New Jersey needs in higher education.

Second, the estimates of enrollment demand published early in 1967 by the Division of Higher Education of the New Jersey State Department of Education were examined with particular care since they were the most recent available.

Third, an independent projection was made from all available basic data including national trends. The methodology used for this projection is described in Appendix A.

The period 1975-1980 was selected as the most important for planning at this time because it is a span of time in which a series of steps aimed at improving New Jersey's undergraduate enrollment capability can be completed. However, projections were extended to 1985, a natural terminal year for enrollment studies begun in 1967, since children born in 1967 will be entering college then.

Because of changes in birth rates in recent years it now appears that the college-age population in New Jersey will actually decline between 1980 and 1985, reaching in 1985 approximately the same figure as 10 years earlier. Statistics on births in recent years show this trend clearly:

1961	135,320
1962	131,603
1963	132,606
1964	131,593
1965	125,104
1966	120,116
1967	117,641

Forecasts beyond 1985 cannot be made without forecasting birth rates. Such forecasts were not considered necessary for this report but it is important that enrollment forecasts 18 years in the future be reviewed when each year's birth rate has been determined.

High school graduations are of course a primary determinant of the size of college freshmen classes. Exhibit 2 shows the numbers of New Jersey public and private school graduates since 1957 and a forecast through 1985. Peaks can be seen in 1960 and 1964, followed in each case by a pause and then renewed growth. The new growth period now under way following the 1965-1966 plateau is forecast to reach a peak in 1980 and then decline.

The effects of this growth on college enrollments is projected on Exhibit 3. It will be noted that a range of expected growth is indicated for the period covered by the forecast. For 1980 the range is from 213,000 to 287,000, 15% on either side of the forecast of 250,000.

The 1975 estimate of 220,000 full-time undergraduate enrollments is substantially the same as the figures shown in "A Call to Action" published by The Citizens Committee for Higher Education in New Jersey and the figures published in May, 1967, by the Division of Higher Education of the New Jersey State Department of Education under the title "Higher Education Projections, 1967-1975".

All these figures deal only with full-time undergraduate students of New Jersey origin. Graduate students are considered separately in this report.

Demand for places by part-time undergraduate students has not been separately calculated because, except in unusual circumstances, it can be accommodated in facilities built for full-time enrollment.

Expansion of demand is caused by both growth in population and an increase in the percentage of youths who attend college - the rising level of aspiration.

Population growth - more specifically growth in college-age population - is responsible for most of the expected increase in total enrollments. The continuing increase in the aspiration of students to higher education accounts for a smaller part. This has been a noticeable factor almost as long as statistics on higher education have been kept and has accelerated in the years since World War II for a number of reasons, including:

1. Rising level of national productivity, which makes it possible for more people to remain out of the work force and acquire education during their early years.
2. Higher income levels, enabling more families to aid in the financing of higher education.
3. Rising investment on the part of state and municipal governments, which has vastly increased the number of public colleges that offer education at relatively low cost.
4. Specific federal government aid to veterans following World War II and more recently to colleges and universities. Such aid has financed many students and encouraged the expansion of a great many institutions.
5. Rising level of job requirements which has increased the average level of training and education needed for employment.
6. A continuing increase in the number of women in higher education.
7. Growing interest in education for its own sake, apart from any vocational benefits.
8. The increase in new types of educational institutions, most particularly the emergence of the junior college.

By providing additional enrollment opportunities in urban centers convenient to large numbers of students and by accepting students who might not otherwise achieve a successful college experience, the junior colleges have been a particularly successful recruiting medium for higher education.

Another way in which the present status of higher education in New Jersey may be judged and future needs projected is through analysis of students by their academic ability level. This was done by following all 1966 graduates of New Jersey high schools, both public and private, subdividing the 90,000 students by achievement level, and finding how many went to college within each group and what kind of college they attended. Exhibit 4 shows the resulting college attendance pattern by ability level.

Graduates were first divided between men and women, and then by fifths, or quintiles, according to their academic ability. Starting with the top fifth - the most talented - nearly 90% of students entered college full time in the fall following high school graduation. Of the lowest fifth, the least talented, about a quarter of the men and fewer than 15% of the women entered college. The following conclusions are drawn:

1. More than half of the college-bound young people in every quintile go out of the State.
2. New Jersey institutions seem to concentrate on the more talented students, leaving an increasing percentage of each lower quintile to go out of the State. Of the 4th and 5th quintiles - which include

many marginal students - from about 70% to nearly 90% of the few who entered college went out of the State. These less talented students have a correspondingly low chance of surviving four years of college.

3. State-supported colleges tend to take students from the top half of the scholastic ladder. Even among these, some are rejected by the State-supported schools, as is dealt with more fully in another section of this report.
4. Rutgers is the most popular institution with men in the top fifth. Another 15% chose private colleges within the State and 52% went out of the State.
5. It appears that State-supported institutions have very little to offer the average students, the 3rd quintile. The few students in this group attending Rutgers or the six State colleges were mostly in the top of the quintile and therefore probably would have placed within the upper half of the graduating class. The State's private institutions serve this group well and the county colleges can be expected to enroll more and more of them. New programs and new concepts of education and training should be particularly effective in serving this group. The county college program holds promise for average and below-average students.

Estimates of the kind of students who will make up the projected 220,000 1975 enrollment may be seen from a projection of ability level data. Such a projection has been made in Exhibit 5 which shows the expected college-bound out of each fifth of the 125,000 who will graduate from high school in 1975. An assumption was made that at least the same percentage of each group will enter college in 1975 as in 1966. Using this assumption, the effect of population increase can be shown.

Estimates were then made of the effect of higher college attendance rates on each of the five ability groups. Results summarized from the exhibit are:

Increase in College-Bound
1975 Over 1966

	Due to Population Increase	Due to Higher Rate of Attendance	Combined
Top Fifth	6,000	1,000	7,000
2nd Fifth	5,000	3,000	8,000
3rd Fifth	3,000	5,000	8,000
4th Fifth	2,500	3,000	5,500
Bottom Fifth	1,500	2,000	3,500
Total	18,000	14,000	32,000

The important growth among students in the middle three groups is evident in the table. Referring back to Exhibit 4, it may be seen that community college students come mainly from these groups.

It needs to be emphasized that the analysis covered only high school graduates of a single year - 1966 - with projections to 1975 - and therefore cannot be regarded as conclusive. A number of estimates and assumptions were made in carrying it out and the conclusions reached should be read in the context of the entire report. Rounding will make figures differ slightly from others in the report. The findings are illustrative, however, when considered along with results of other analyses and are helpful in the planning process. Assistance in preparing these data was provided by the Educational Testing Service.

The growing demand for enrollments as outlined in this section can be met in three groups of institutions - State public, State private, and out of State. The next section of the report takes up the question of how many students the New Jersey public institutions should serve.

V. NEW JERSEY PUBLIC HIGHER EDUCATION REQUIREMENTS

Public colleges and universities throughout the United States have served a growing share of the nation's students as can be seen in Exhibit 6. The percentage of students enrolled in public institutions has increased from 40% at the turn of the century to more than 60% and is projected to reach 75% within a few years. Other parts of the same exhibit show the substantial increase in the role of state governments in supporting higher education.

Growth in New Jersey public enrollment will have to be at a greater rate than the national growth if progress is to be made in overcoming present shortcomings in the State. At present relatively few New Jersey students find low-cost public institutions available to them and for this reason the average cost of higher education to the State's students is relatively high.

Exhibit 7 shows the distribution of full-time undergraduate students for 11 large industrialized states and the United States for 1963, the most recent year in which a comprehensive nationwide study was made. Developments between 1963 and 1966 have not changed the basic relationships.

Each bar on Exhibit 7 indicates proportions of a state's own students enrolled inside or outside the state at public or private institutions. Each of the segments on a bar represents a different cost level in about the following relationships:

U. S. Average Higher Education Tuition and Fees
1966-1967

Private	$1,240
Public - Outside Own State	618
Public - Within Own State	268

In preparing Exhibit 7, actual costs in each state were used to compute the averages shown. In New Jersey the average cost in 1966 was calculated to be $934 per student in a school year while the United States average was close to $540. In other words, on the basis of averages it cost the New Jersey student nearly $400 more for tuition and fees. Costs of board, room, and transportation are not included but undoubtedly are also high for New Jerseyans since only 28% attend public institutions within their own State, lowest but one among major states. The national average is 57%.

Evidence of the inadequacy of New Jersey's public institutions is found in their high rejection rates of prospective students. Commonly some unit of a state's public college and university system will take nearly any graduate of a high school within the state. Two studies show that in New Jersey this is not true.

An analysis was made of some 12,000 persons who applied to the six New Jersey State colleges in 1966. Details are found in Appendix F. The principal finding was that 5,200 prospective students were rejected and of these 49% were in the top half of their high school graduating class.

Conservatively, considering top-half students to be widely acceptable, it can be said that at least 2,500 qualified students were rejected by the State colleges essentially because of inadequate space. On a four-year basis allowing for attrition this would be the equivalent of about 7,500 enrollments.

Also in Appendix F is a summary of a more extensive study made for Rutgers • The State University by the Educational Testing Service and published in June, 1966. It found that, of 8,500 students rejected by Rutgers, 4,000 were considered qualified by the university but were turned away because of lack of space. The four-year equivalent would be about 12,000 students.

Another type of limitation is in the programs offered by State institutions, particularly the heavy concentration on teacher training. Figures from the United States Office of Education in a report, "Earned Degrees Conferred, 1965-1966", shows that bachelor's degree recipients who are prepared for teacher certification make up 53% of New Jersey college graduates but only 35% in the United States as a whole, both figures covering only public colleges and universities. For a great many students not interested in teaching, the choice among public four-year institutions has been limited to Rutgers and Newark College of Engineering.

The result of these and several other factors is a high rate of student outmigration - 54%, far above the United States average of 21%.

Increased average cost to students is one result of the lack of college capacity within the State. Another is the economic loss to the State. Each student going out of the State takes with him an average of about $1,000 a year to pay for tuition and fees and an additional $800 for room and board. An estimate elsewhere in this report shows that currently one-fourth of all outmigrants - or between 18,000 and 20,000 students - go outside the State when they would rather remain. The direct economic loss they represent is estimated to range from $15 million to $36 million, without including personal expenditures or transportation.

Enlarged colleges would also offer a host of indirect economic benefits against which are offset the costs of operating the institutions. Most states have concluded that the economic and social benefits of a well-developed public system of higher education more than outweighs the cost of such a system.

Still another result of the present situation has been the fact that few out-of-state students come to New Jersey public institutions. Presently the over-all rate at the State's public institution is 4%. Nearby Pennsylvania has 8% from other states and the United States average is 12%.

In many states, public institutions regard out-of-state students as desirable and have encouraged the enrollment of some limited number of students from other states. Until recently, the New Jersey State colleges excluded students from outside the State.

In view of the foregoing limitations of the New Jersey public higher education system and the coming enrollment increase, it was next necessary to determine just how the system should grow. What follows is an examination, segment by segment, of the State's public higher education system and recommendations for the size of each segment.

Recommended Enrollment Capacity of State Colleges

A substantial part of the expansion of New Jersey's public education system should be in the State colleges. The six State colleges - Glassboro, Jersey City, Montclair, Newark, Paterson, and Trenton - are established institutions with considerable expansion capability and most are in heavily populated areas, making it possible for them to serve large numbers of commuter students.

Various approaches were taken in determining desirable objectives for size, and therefore facilities, of the State college system.

The first was to project the effect if the most qualified of the 5,200 applicants rejected by the State colleges in 1966 had been accepted. In the fall of 1967, enrollment in State institutions totaled some 21,000 full-time undergraduates. Estimates were made of how large the State system would have had to be to accommodate the well-qualified applicants who were turned away.

According to the data gathered by the State Department of Education, most of the 5,200 students were rejected for lack of space although in some cases it was for the related reason that the admission quota in the field of their choice was already filled. Of these rejected prospective students 49% - about 2,500 - were in the top half of their high school classes and could by most standards be considered qualified. If the same number were rejected each year and allowance was made for normal attrition among four entering classes, the total would have been approximately 7,500.

Therefore, if nothing were changed except to remove the limitations on size, the State colleges would in the fall of 1967 have accommodated about 28,500. This figure includes the 21,000 plus 7,500 who were rejected in 1967 and the three preceding years. This amount is probably low since it can be assumed that many prospective students did not apply because the difficulty of gaining admission is widely known. Furthermore, more applications would undoubtedly have been received if non-teaching programs had been more readily available.

At any rate, 28,500 can be accepted as a base figure. Growth of over-all State-wide enrollment demand by 1975 to a level of 220,000 as described earlier would be an increase of 57% over 1967. An increase of 57% over the base figure for the State colleges would raise their enrollment to 45,000 in the 1975-1980 period.

Review of expansion plans with the six colleges and the State Department of Education revealed that no over-all program had been developed for growth of the State college system as a whole through 1975.

While there were no coordinated plans, each college had its own views on the expansion capabilities of its campus and the goal it hoped to reach. These goals were reviewed with each college, and tentative estimates were made of the size to which each should be expanded. The estimates were correlated with the locations of students as projected by county and region. For this purpose estimates of enrollment demand had been made for each county in the manner described in Appendix B.

A pattern by county of origin of students now attending the six State colleges was also developed. This pattern was projected to the 1975-1980 period with allowance made for the different growth rates of counties. The following assumptions were made:

1. Out-of-state students would be invited into the State colleges up to about 5% of total enrollment, although it may be difficult to reach this level because these colleges are not well known outside New Jersey.
2. About two-thirds of all students would be commuters. Most resident students would live in dormitories although some would live in approved housing near by. The pattern would differ at each college.
3. From one to four new State colleges might be proposed for addition to the present six if this appeared reasonable within the developing patterns.
4. The State colleges would depart from their role as teachers colleges and prepare to accept students with a wide variety of interest and needs.

5. Excessive concentration of students on one campus should be avoided. "Excessive" for this purpose was broadly defined as about 10,000 full-time students.

On the basis of the foregoing assumptions a hypothetical distribution of enrollment was made, adding up to 42,800 New Jersey students. About 10,000 of the total would be in two new State colleges, one in the north and one in the south.

This is the distribution pattern developed:

State Colleges	1967	1975-1980 Proposed
Glassboro	3,530	5,500
Jersey City	2,878	4,000
Montclair	4,314	6,700
Newark	3,186	5,400
Paterson	3,059	4,100
Trenton	3,788	7,300
New - South	-	4,000
New - North	-	5,800
Total	20,755	42,800
Out-of-State Students	*	1,900
Total - All Students	20,755	44,700

* Fewer than 50 included in total.

It is recommended that development of the two new State colleges begin at once. In fact no element of the State college expansion plan can be long delayed if admittedly ambitious goals are to be met.

Location of the two new colleges is indicated here only as "south" and "north". Selecting the exact site is a complex task which must take into account many factors beyond the scope of this work.

Concurrent with work on the proposed size of State colleges, recommendations were developed for other parts of the public higher education system. County colleges are taken up next.

Enrollment in County Community Colleges

In determining how many of the 220,000 projected undergraduates may be expected to seek admission to two-year colleges, reference was first made to national and state ratios in the division of enrollments between two-year and four-year institutions.

The upper part of Exhibit 8 shows that there has been steady growth in the ratio of two-year college enrollment to total undergraduate enrollment. The two-year colleges had about 11% in 1950 and 17% in 1965, the most recent year available. The difference between these figures and 100% is enrollment in four-year institutions.

Projections were made to the year 1975 by the United States Office of Education. Taking into account states that have well-developed systems now and those that do not, USOE forecasts that in 1975 about 19% of all college enrollments will be in junior colleges.

Another section of the same exhibit shows selected 1966 data for a number of states. California and Florida have about 43% of their undergraduate enrollments in junior colleges. New York currently has about 21% and the states shown decline from there through New Jersey at 5.5% and Ohio at 3.7%.

California is high because of provisions of its higher education system which permit only the top 12% to 15% of high school graduates to apply at the University of California and the top third to state colleges. All other high school graduates who want to attend college in the state are expected to enroll in the California junior college system.

It is apparently the intention of junior college planners in New Jersey to have admissions open to all high school graduates with perhaps some limitations. It is not expected, however, that the New Jersey system will be as rigid as that of California where the lower two-thirds of all high school graduates are eligible only to enter junior colleges or private colleges, and not public four-year institutions. For this reason California's high ratio of junior college enrollment to total enrollment will not occur in New Jersey unless the State should adopt a similar stratification plan.

New Jersey could, of course, expand only its junior colleges and thereby raise its share of the State's total capacity. However, this would not by itself satisfy the strong unfilled demand for places in four-year institutions. An overbuilding of junior college capacity at the expense of four-year capacity would force an increasing number of students to go out of the State to four-year colleges.

California presents a very different situation, since it is a relatively isolated state. Colleges within a radius of 700 miles of the major population centers in California could, as a practical matter, accommodate less than 10% of California's present college enrollment. For this reason there is no practical alternative for most California students but to follow the state's plan emphasizing junior colleges.

By contrast, for New Jersey a 700-mile distance encompasses all of New England and much of the Middle West and South. Also, many thousands of students can live in New Jersey while attending out-of-state colleges.

Experience within New Jersey, while limited, can provide some indication of the role two-year colleges will play.

At the bottom of Exhibit 8 are data on five New Jersey counties which now have new two-year colleges. The share of total college population in each county enrolled in community colleges ranges from 12% to 25%, excluding for this purpose students who have come in from other counties. Weighted average is 16% for the five counties. Three of these counties - Ocean, Cumberland, and Atlantic - previously had no generally available higher education facilities.

Considering all factors, the pattern that is likely to be reached in New Jersey will be more like that in states where there is a freer choice than in California - states such as New York with 21% in junior colleges, Illinois with 19%, and Pennsylvania with 13.9% in either junior colleges or two-year branches of the state university.

New Jersey's new county college system has so far reached about 5% of total State enrollment. By 1975 New Jersey, with its rapidly growing system of public community colleges, should be approximately at the national average with about 20% of total full-time enrollments in two-year colleges. Of these it is estimated that the great majority, 42,000, will be in county colleges and the rest either in private New Jersey junior colleges or out of State.

The percentage of freshman students going to junior colleges will, of course, be much higher than 20%. Nationally it is now about 29% and in 1975 it is forecast to be about 31%. This means that among high school graduates who go to college, something less than one-third will enroll in two-year institutions.

Junior College Transfer Students

As explained previously, projections for New Jersey in future years take into account the effect of all influences that act on enrollments. Among them are the generally increasing level of college attendance and the progress of the junior college movement, including the ability of junior colleges to generate transfers to the four-year institutions. For this reason, no special increment need be added to allow for transfers. However, because it is a subject of considerable interest, this section of the report examines some forecasts of the numbers of junior college transfer students in the years ahead.

A study was made by the New Jersey State Department of Education in May, 1967, to determine some of the aspects of transfers from two-year to four-year colleges. There are many arrangements to be made to insure that students can transfer on terms beneficial to them. It was the important work of this study to begin to develop ground rules for such transfers and, at the same time, estimate the number of transfers.

In May, 1967, heads of all the State's junior colleges, including county colleges in the planning stage, were asked to predict enrollment for the 1969-1970 school year and to estimate the number of graduates and those who would wish to transfer to four-year institutions. Total enrollment on a full-time basis was forecast to be 18, 000. Of these students it was estimated that 6, 658 will graduate and 2, 700 to 3, 000 will wish to transfer at some time during the year to a four-year institution either in New Jersey or outside.

Since it is obviously difficult to determine rates of graduation and transfer from institutions that are not yet open, Robert Heller Associates made a study of junior colleges in other states with particular attention to their graduation and transfer records. The 55 colleges studied are in six states - California, Massachusetts, Illinois, Florida, Michigan, and New York. On the basis of this study it appears that about 16% of total full-time students graduate in a given year and those that transfer to a four-year college represent about 10% of total full-time enrollments.

Comparison of these results with projections based on the 1967 study shows a considerable difference. For a full-time enrollment of 18,000 in 1969-1970 the comparison is:

	May, 1967 Study	RHA Estimate
Graduates	6,658	(16%) 2,880
Transfers	2,700-3,000	(10%) 1,800

While the New Jersey community colleges cannot for several years make such a forecast out of their own experience, the record elsewhere suggests that the number of transfers may be well below the level projected by the 1967 study.

Application of the percentages obtained from the experience of other states to the 42,000 full-time students to be enrolled in New Jersey county colleges in 1975 would indicate that during each year in the 1975-1980 period about 4,000 to 4,500 will seek to transfer to four-year colleges either inside or outside the State.

Rutgers - The State University

In 1967 all the undergraduate units of Rutgers enrolled about 12,000 full-time New Jersey students, which was 8.6% of all New Jersey undergraduates. About 1,500 students came to Rutgers from other states.

In developing enrollment recommendations for the 1975-1980 period an analysis was first made of Rutgers' own plans. They were found to be generally well conceived and to represent a coordinated pattern of growth for this major institution, but it was desirable to study them in light of the growth expected in each area of the State.

It was concluded that the University's planned expansion would meet growing needs if facilities could be provided on the required schedule. An exception was Rutgers-Newark where growth predicted by the University for the College of Arts and Sciences was from 2,500 full-time students in the fall of 1967 to 7,659 in 1975 and thereafter. This seemed high in view of the following:

1. Increased capacity of other Rutgers installations, particularly the two new colleges at Kilmer.
2. Growth and diversification of other colleges in the Newark area, particularly the four State colleges which, for the first time, will be seeking numbers of students interested in fields other than teaching.
3. Growing enrollment at adjacent Essex County College and Newark College of Engineering.
4. Relatively little growth of demand within commuting range.

For these reasons the recommended objective for Newark College of Arts and Sciences is set at a lower figure of 5,000, plus an additional 300 in the College of Nursing.

It is recommended that Rutgers plan to accommodate 20,800 full-time New Jersey undergraduates in 1975-1980, including the 5,000 at Newark. This would raise the Rutgers share of total college enrollment in the State from 8.6% to 9.5%. To this enrollment would be added approximately 2,200 students from out of the State, making a total of 23,000.

Newark College of Engineering

The enrollment objective developed for Newark College of Engineering is based on three considerations - objective of the administration, site limitations, and demand for engineering enrollment.

NCE is now one of the largest engineering schools in the country as measured by bachelors degrees conferred and its administration believes only a modest growth in undergraduate enrollment should be provided for. Limited space on the present site is an added restriction. Most important, forecasts of engineering enrollment detailed elsewhere in the report indicate only a small increase in the next several years. For these reasons enrollment of 3,400 New Jersey undergraduates at NCE is recommended. In 1967, 2,684 full-time undergraduates were enrolled.

Because of the declining popularity of engineering the recommended number would represent a drop in NCE's share of total enrollment from 1.9% to 1.5%. It is expected that about 200 students can be attracted from out of State, making a total of 3,600 full-time undergraduates.

A summary of the recommended growth plans for the New Jersey public higher education system is included as Exhibit 9. The total number of full-time undergraduates recommended is 109,000, which compares with 40,800 in fall, 1967, and represents a challenge difficult to meet by 1975. For this reason throughout the report the plan of growth has been treated as establishing goals not for a single year, but for the period 1975-1980.

The expansion proposed would enable New Jersey to provide greater opportunities to the growing numbers who seek a higher level of education than they have had within reach in the past. Many would be served by the county colleges.

By carrying out the plan the State will provide for 49% of its college students in public institutions. While this is well above the current 28%, it will still be lower than the United States average which is expected to be above 60%, perhaps as high as 70% in the 1975-1980 period.

The next section of the report deals with planning for the remaining New Jersey undergraduates who do not enroll in public institutions within the State.

VI. PLANNING FOR STUDENTS WHO WILL ATTEND OUT-OF-STATE AND NEW JERSEY PRIVATE INSTITUTIONS

While all colleges compete with each other for students, it has been assumed in this planning work that in-state public institutions will fill the capacity for which they build. The balance of the students will attend in-state private or out-of-state institutions.

With 109,000 as the proposed enrollment in State public institutions in 1975-1980, estimates are that approximately 111,000 undergraduates will attend New Jersey private and out-of-state institutions.

Studies made by RHA reveal that while public institutions are crowded, many private institutions in New Jersey have had unused capacity in recent years, a situation that is not peculiar to New Jersey but is found widely over the country.

Out-of-State Analysis

Students have for many years left New Jersey for college in large numbers - 75,000 in 1967. Many presumably will leave in future years for a number of reasons, including New Jersey's small size, nearness to the great institutions of New York and Philadelphia, relatively high income level of New Jersey families, good college preparation in secondary school, and a long tradition of going away to college.

Exhibit 10 summarizes significant pieces of information about this group.

About 25% of those who leave the State attend public institutions. As inmigrants they probably had to present better credentials for admission than students native to the state. In many states they are subject to geographic quota restrictions which may become more severe. The 75% who attend private institutions are not subject to quota but enter on their merit, tempered by ability to pay.

Another section of the exhibit shows that about 15,000 outmigrants go only as far as metropolitan New York or Philadelphia, and about half of them commute from New Jersey. The great colleges and universities of these two areas will no doubt always be popular with New Jersey students.

Looking further at geography, it may be seen in the exhibit that Pennsylvania, New York, and the New England states together draw just over half of the outmigrants. The others are spread very widely: Ohio 6%, Florida, North Carolina, and the District of Columbia each 3%; and there are some New Jersey students in every state but Nevada and Alaska.

Finally, Exhibit 10 contains data on the competitive level of schools attended by New Jersey outmigrants.

Many undergraduate students who go outside New Jersey attend colleges that are difficult to enter. A respected method of rating on the basis of relative difficulty of gaining admission is the one used in "Barron's Profiles of American Colleges", 1966 edition.

In terms of the difficulty of entry, Barron's divides colleges and universities into the following categories:

Most Competitive
Highly Competitive
Very Competitive
Competitive
Less Competitive
Non-Competitive
Special Interest

About 36% of the New Jersey residents who leave the State attend colleges ranked "very competitive" or higher. An additional 27% go to colleges ranked "competitive".

This sheds some light on the important question of the extent to which the outmigrants leave the State voluntarily and the extent to which they may be said to be "forced out" by the lack of higher education facilities within the State. Competitive quality of the institutions attended by almost two-thirds of the outmigrants suggests that most of this group of students left the State voluntarily.

To gain further insight into the proportions of outmigrants who leave voluntarily and involuntarily, separate studies were made of applicants rejected in 1966 by Rutgers and the six State colleges. Some details of these studies are in Appendix F. Summarized, the results are as follows:

2

Rejected Applicants Who Attended Out-of-State Institutions

	1966	4-Year Equivalent
State Colleges	1,720	5,000
Rutgers	2,160	6,000
Total	3,880	11,000

This estimate, then, is that about 11,000 students now attending out of State colleges were "forced out" because they were turned down by the State institutions. That is about 15% of all outmigrants.

Guidance Counselor Survey

As another means of learning the preferences of New Jersey students, a questionnaire was sent by RHA to every high school in the State, both public and private.

Questions asked of guidance counselors were aimed at determining the number of high school graduates in 1966 who went out of the State to enter college, the proportion of these who went out of State by their own preference, and those who would have preferred to attend college in New Jersey. Results are summarized in Exhibit 11.

Of those who attended college in the same year in which they graduated from high school, responses showed that 40% enrolled within the State and 60% outside the State. This is a slightly higher percentage going out of the State than estimated elsewhere in this report, probably because some students go out of State to college initially and then, for a variety of reasons, return to the State to finish their higher education.

Of the 60% of freshmen going outside the State, guidance counselors reported that one-quarter (equal to 15% of total graduates going to college) would have preferred to attend college in New Jersey.

About 43,500 graduates of New Jersey public and private high schools went on to college in 1966. If 15% of them went to college outside the State, contrary to their preferences, the number would be 6,400 entering freshmen students, equal to about 16,000 to 20,000 total enrollment.

From the preceding evidence two principal conclusions are drawn.

First, the view expressed by some that New Jersey's policy should be to eliminate outmigration is unrealistic. Most students who study outside the State do so voluntarily and it would be difficult as well as unnecessary to change this. Even as the capacity and diversity of New Jersey's higher education system grows, it is the conclusion of Robert Heller Associates that a substantial number of the State's residents will continue to seek higher educational opportunity outside the State. This conclusion is based on historical college attendance patterns and the fact that many students wish to "go away" to college. In a small state, "going away" to school usually means leaving the state.

Second, the feeling that New Jersey students are forced out of State has truth in it. Indeed some are forced out, and the evidence gathered here indicates that between 16,000 and 20,000 of the 75,000 outmigrants in 1967 were turned away from the State institutions. Planning in this report has made use of that estimate.

Outlook for New Jersey Students in Other States

With steadily rising numbers of New Jersey students going elsewhere for their higher education, some concern has been expressed that colleges in other states might impose limitations or be unwilling to accept these students because of a feeling that New Jersey was not providing adequately for its own requirements.

The conclusion reached during this study is that, provided New Jersey enrollment capacity grows at about the rate recommended in this report the number of outmigrants should not become so large as to make students face large-scale exclusion.

The conclusions concerning the capacity and willingness of out-of-state institutions to enroll New Jersey undergraduates are based on three separate surveys. One was a comparison of projected numbers of undergraduates with growth patterns of educational institutions generally. Another was concerned with plans for higher education physical facilities as they relate to probable enrollments in the period to 1970. And the third was a mail survey of colleges and universities that have traditionally enrolled substantial numbers of New Jerseyans.

Comparison of Growth Patterns

Of the New Jersey undergraduates attending out-of-state institutions in 1967-1968, about 75% were in private colleges and the remaining 25% in public institutions.

Prospective growth rates, as estimated by the United States Office of Education, were applied to each group of institutions. According to these estimates, enrollment in private colleges and universities will increase 21% by 1975 and the increase in the public sector will be 46%. If the reasonable assumption is made that in the course of this growth places can be found for approximately the same proportion of New Jersey residents as in 1967-1968, the following results are obtained:

New Jersey Undergraduates in Out-of-State Colleges

	1967-1968	Growth Factor	1975-1976
Private	56,000	21%	68,000
Public	19,000	46%	28,000
Total	75,000		96,000

On the basis of this purely statistical examination, therefore, there seems to be no early likelihood that students from New Jersey will be rejected in large numbers by out-of-state institutions. However, should the number of New Jersey outmigrants rise to a level of about 100,000, they may begin to encounter difficulty in gaining admittance to college. This situation would come about if the New Jersey institutions fail to expand adequately.

The foregoing conclusion is based on the assumption that the out-of-state institutions will grow at the rates predicted by the United States Office of Education. However, as will be noted later in this report, the private institutions throughout the United States face increasing financial difficulty. Should these difficulties result in less-than-expected private college capacity in 1975, the "saturation point" of New Jersey residents in out-of-state colleges may be less than the 100,000 level.

A distinction must be made between private and public institutions. In general, private colleges and universities welcome students from other states. It is the public colleges and universities that sometimes restrict or entirely exclude students from other states, as in fact the New Jersey State colleges did until recently. Therefore, if any restrictions should be placed on New Jersey residents by out-of-state institutions they probably would affect only the 25% who attend public colleges.

Enrollment and Facilities Survey

Further light on the expansion plans of colleges and universities comes from a study titled "College and University Enrollment and Physical Facilities Survey, 1965-1970" published by the United States Office of Education in September, 1967. This study sought to determine the total expansion of capacity planned by institutions throughout the country by obtaining individual facilities expansion plans from each.

Results showed that plans are to increase capacity to accommodate full-time undergraduate enrollment by 47% between 1965 and 1970. Public institutions plan for a somewhat larger share of growth than the private ones. This study takes on special significance when the projected facilities expansion is compared with recent forecasts of student enrollment expansion as gathered by another section of the Office of Education. These forecasts indicate that the 47% expansion of capacity by 1970 will be accompanied by an increase in enrollment of only 30% above the level of 1965. Theoretically, this difference on a base enrollment of some 3,600,000 in 1965 indicates an overbuilt condition of about 600,000 places in 1970.

Actual results of the previous study in the same series made for the period from 1960 to 1965 are available to compare with estimates. They show that in most cases colleges and universities as a group guessed low in 1960 on what their enrollment would be by 1965. Now they appear to be guessing high.

Having underestimated previous enrollment expansions, it is possible that many institutions have now overestimated. It is also likely that many expansion plans will be modified.

Even if the apparently excessive expansion becomes reality, the situation for New Jersey students will not change greatly. Increased capacity in private institutions would not be significant since most private institutions now are ready, willing, and able to accept New Jersey students. Overbuilding of public institutions in other states might create extra capacity that could potentially be filled by additional New Jersey students. However, these would be more expensive places than at public institutions within New Jersey. Most state universities assess extra tuition on out-of-state students and this has been rising in recent years.

Data for the facilities study were obtained from individual institutions and their projections may have been made without giving full recognition to the competition for students among various institutions. A forecast made simply by adding up individual expansion plans of institutions is likely to be less accurate and useful than one based on state-wide and national trends.

Mail Survey of Attitudes

To supplement the foregoing surveys and to better determine the attitude of out-of-state institutions toward taking New Jersey's students, a letter of inquiry was sent to 115 colleges and universities that enroll the largest numbers of New Jersey undergraduates. Answers were received from more than 80% - a remarkably high proportion.

Principal conclusions drawn from the replies are:

1. Out-of-state private institutions welcome New Jersey students - in fact seek them and in a great many cases would be glad to have more.
2. Private institutions are not growing rapidly and many have no plans for growth.
3. Public institutions generally maintain a quota on out-of-state students of between 5% and 15%. Most public institutions responding to the survey indicated that they intended to maintain this percentage. Therefore the number of out-of-state students should increase as the total size of the institutions grows. However, it was also indicated that the competition will become more severe for the limited number of out-of-state places.
4. Evidence of outright exclusion of New Jersey students appeared in only one instance. A large midwestern state university has for several years restricted admission of applicants from New Jersey to the well-qualified sons and daughters of its alumni. It was explained that the demand for admission has been so high that in order to preserve some geographic distribution in the university's out-of-state quota it was necessary to place the limitation on New Jersey applicants.

Replies further indicate that in the future well-qualified, high-ranking New Jersey high school graduates will be able to enroll in the major public institutions in other states. The average or below-average student will have an increasingly difficult time getting into leading public colleges and universities in other states.

In summary, it is the judgment of Robert Heller Associates that outright exclusion of New Jersey students by institutions in other states does not present a serious threat - certainly not to highly qualified students. It is likely that out-of-state colleges can enroll considerably more New Jersey students without undue strain on their facilities if their present growth plans are realized and if New Jersey's facilities expand about as outlined herein. The problem then is not so much one of exclusion of New Jersey students but the fact, dealt with more fully elsewhere in this report, that the relatively low public college capacity in New Jersey greatly increases college attendance costs to New Jersey residents and thereby decreases the availability of college education to many residents.

New Jersey Private Colleges and Universities

The decade of the 1950s brought rapid growth in New Jersey's private colleges and universities. The private and the State-supported sectors expanded at about the same rate, in sharp contrast to the national trend which showed public institutions growing far more rapidly than the private ones. Exhibit 12 shows the comparison. By 1960 New Jersey State-supported institutions were well behind national growth trends and New Jersey private institutions were far ahead.

Since 1960 New Jersey's State-supported colleges and universities have grown at about the same rate as all United States public institutions, but they have not made up for their slow rate of expansion in previous decades.

The greater than average growth of New Jersey private colleges and universities in the postwar years came about because, in a real sense, they accepted the responsibility the State did not assume for needed expansion of higher education facilities.

In particular, Fairleigh Dickinson, Monmouth, Rider, and Seton Hall underwent substantial expansion. Together they provided the new or enlarged facilities the State did not build in the 1950s.

Several of the smaller private colleges also helped to fill the need, although their role may have been limited because of religious affiliation or specialized curriculum. They are important not so much in size as in the diversity they provide.

Certain "national" institutions, such as Princeton, are extremely important assets to the State although they enroll relatively few of the State's residents.

Today many of the New Jersey private colleges, like others across the country, face difficult financial problems at the same time that belated expansion of public institutions is taking place. Through broadening and upgrading curriculum, the State colleges will provide added competition.

The private colleges will also continue to face strong competition from out-of-state institutions. Some measure of relative drawing power can be seen in material from a study entitled "Doctorate Recipients from United States Universities", published by the National Academy of Sciences. The study provides information on the undergraduate colleges attended by students who went on to earn doctorates (excluding M. D. and D. D. S. degrees) between 1960 and 1966. Many good students are drawn to institutions that are likely to prepare them well for graduate school.

Figures were obtained for the 15 out-of-state colleges and universities most popular with New Jersey students. Fourteen of these are private and most are in New York and Pennsylvania. Data for New Jersey colleges and universities were also compiled for comparison. The institutions have been included, not for the number of doctorates they themselves award but for the number of their bachelor's recipients who go on to earn doctorates. The comparison follows:

	Ph. D. 's Per 100 Full-Time Students
Princeton	14.4
15 Out-of-State	4.8
Rutgers and NCE	4.8
United States Average	3.5
All Other New Jersey Private	1.6
6 New Jersey State Colleges	1.5

The significance of the foregoing table is that the New Jersey private colleges, with the exception of Princeton, must improve their attractiveness if they are to compete effectively against out-of-state institutions for the more able students. (The same can be said for the New Jersey State colleges.)

Maintaining a viable system of private education will become increasingly difficult and expensive. For this reason it is important to consider the financial situation of the independent colleges in New Jersey.

Financial Needs of Private Colleges and Universities

The financial plight of the nation's private colleges has been well publicized in the last few years. Over the long term approximately 20% of total college and university expenditures are capital expenditures for physical plant and the remaining 80% cover operating expenses. For the most part the New Jersey private colleges and universities have been able to meet their needs for capital funds. They will probably continue to be able to do so, particularly since their future growth plans should be relatively modest as will be seen in the following section. Moreover analysis of the facilities of the private colleges indicates that many of them can expand enrollment through improved utilization of existing facilities with little or no expenditure for additional physical plant.

It is in the area of operating income that the private college financial problem is becoming acute. Operating costs are rising faster than operating income, despite continued increases in student tuition and fees. On a national basis, the public institutions over the past 10 years have increased tuition at an average annual compounded rate of about 4.5%. As pointed out in the October 1967 issue of Fortune magazine, this is about equal to the annual increase in median family income. By contrast the nation's private institutions have been increasing tuition at an annual rate of 8%.

The high tuition and fee charges at private colleges are, of course, making it more difficult for them to compete with the public institutions for students. Currently the tuition and fee charges at the New Jersey private colleges and universities average almost four times those of the State's public institutions.

Exhibit 13 illustrates for selected types of colleges and universities the sources of current fund income, excluding auxiliary enterprises which are generally self-supporting. Among all institutions in the United States tuition and fees provide 24% of total operating income. At a typical large state university the tuition and fees account for 20%. At a highly endowed private university with substantial governmental research activity, the figure is 37%. At a typical Catholic church-related college tuition and fees provide 62% of current fund income. However, at a typical small private college, tuition and fees in 1966 accounted for 88% of operating income and a projection by Robert Heller Associates through 1976 indicates that this figure will rise to 94% unless the college manages to find other sources of current fund income.

As operating costs continue to mount it is becoming clear that the private institutions in New Jersey and elsewhere can no longer rely on continuing increases in tuition and fees if they are to remain in a competitive position and be strong elements in the higher educational system. It is recommended that the State of New Jersey give serious consideration to the operating income needs of its private colleges and universities, particularly those institutions not highly endowed which accommodate large numbers of New Jersey residents.

Without assistance from the State or other sources, it is probable that some of the State's private colleges in the future will be unable to continue operating, and the State will find itself in the position of being forced to take them over. The State can ill afford to lose the enrollment capacity now represented by any of its larger private institutions and a forced State takeover would cost the taxpayers substantially more than would a yearly contribution to maintain a college as an essentially private institution.

Specific recommendations concerning the forms and amounts of any such State aid are beyond the scope of this study. Various forms of aid are possible. The State could consider the provision of a direct operating subsidy to various of the private institutions. An alternative method favored by many of the private colleges is tuition subsidy to the students attending private institutions. This would reduce the four-times differential between private and public institutions and enable more students to attend private institutions. Legislation that would accomplish this is now being considered in the State. Tuition subsidy programs could be based on a major expansion of the State's present scholarship program. Such a program would, of course, have the effect of assisting New Jersey college-going residents as well as the private institutions.

As shown on Exhibit 14, New Jersey currently provides two forms of higher educational support to its residents. By far the most important form of this support is the subsidy provided students at public institutions in the form of low tuition costs. In 1966, 29% of the State's students attended New Jersey public institutions and received this form of support. In addition 16% of the State's residents enrolled in New Jersey public colleges and universities also received State scholarship aid. By contrast only 12% of the New Jersey residents attending in-state private institutions received scholarship aid and only 7% of those going out of the state received it. All told, those students attending in-state public institutions received about 90% of the State's total "support dollars" which consists of both the scholarship aid and the tuition subsidy at the public institutions.

Another form of state aid to be considered is the contract college arrangement wherein a private institution operates one or more of its units under contract with the state. This is probably most feasible for a specialized facility such as an engineering school.

The private colleges and universities in New Jersey are an essential element of the State's higher educational system and many of them have filled a role that in other states has been performed by public institutions. Appropriate steps should be taken by the State to assure the continued viability and financial soundness of its private institutions.

Patterns of Student Distribution

The New Jersey board of Higher Education has recommended that plans be made to hold the number of New Jersey residents attending college out of the state in 1975-1980 close to the current 75,000. Since about 111,000 students will at that time be accommodated in New Jersey private and out-of-state institutions, the State's private colleges and universities would have to enroll 36,000 students to hold outmigrants at the 1967 level. This would call for an increase of 50% above the present enrollment of New Jersey residents in the State's private colleges. This and two alternate distribution patterns of the 111,000 students in 1975-1980 are shown in Exhibit 15 and in the table below:

Alternate Models of Distribution
of 111,000 New Jersey Students
in 1975-1980

	Attending In-State Private Institutions		Attending Out-of-State Institutions	
	Number	Increase Over 1967	Number	Increase Over 1967
Model A	24,000	-0-	87,000	16%
Model B	30,000	25%	81,000	8%
Model C	36,000	50%	75,000	-0-

It was not feasible to separately project the future growth rate of each New Jersey private institution because most of the institutions have not yet developed specific well-defined growth plans. Further, such growth plans should be based on the expansion plans of the public institutions which, at the time of this planning, were not known.

Throughout the United States as a whole, recent enrollment statistics for private colleges and universities show little growth. Entering freshmen enrollments have been stable for the last few years and many institutions have seen declines in freshmen enrollments. This pattern, coupled with their financial problems, suggests that private colleges should proceed cautiously in any expansion plans.

For the New Jersey private colleges as a group, a logical course of action at the present time would seem to be to provide for growth of about 25% to the 1975-1980 period, or a little less than 3% a year. Actual goals for each college will of course be determined by the institutions themselves.

Growth of 25% from the present 24,000 would provide places for 6,000 additional New Jersey residents. Approximately that number of additional places are now available in New Jersey private institutions within present facilities, according to a campus-by-campus study made during this project. However, not all college places are equally available to all students. A place in a teacher curriculum is not useful to an engineering student. A place in a women's college is not available to a man. A place in a northern college is not available to a student from the south unless there is also dormitory space.

For this reason the private institutions will require some additional space to offset shortages in some facilities, to modernize, and to provide for new curricula. Even so, relatively few new facilities will be required to enlarge enrollment within the suggested 25%.

VII. COUNTY BREAKDOWN OF ENROLLMENT DEMAND

The total State-wide demand for undergraduate places was broken down county by county to provide further guidance on the needed future capacity of the public institutions and to assist in projecting suitable ratios between dormitory and commuter students. These calculations are described in detail in Appendix B.

Enrollment demand by county is shown in detail in Exhibit B-1 of Appendix B and is graphically summarized in Exhibit 16. A series of bars on Exhibit 16 represent projected enrollment demand in 1975-1980 in each county. Segments of the bars show the expected enrollment demand at each of the following:

Eight State Colleges
Rutgers and NCE
County Colleges
New Jersey Private and
  Out-of-State Institutions

For all counties the total is 220,000. It should be emphasized that the exhibit shows not where the students attend college, but where they come from. Thus, for Cape May County segments are shown for State colleges, Rutgers, NCE, and county colleges even though all students must leave Cape May County to attend these institutions.

These data made it possible to estimate the number of commuter and resident students that could be expected at each public college. They also provided guidance as to the placement of the proposed two new State colleges.

Another important part of the analysis was to determine the approximate required size of each county community college. This was done by taking into account both the apparent demand in each county and each college's own projection of enrollment. The results should provide reasonable guides at this early stage for the development of each of these new institutions.

VIII. PUBLIC ENROLLMENT IN NEW JERSEY

On the basis of the assumptions and projections described in preceding sections, a summary was prepared of the recommended size of each of the 24 public institutions expected to be part of the State's higher education system in 1975-1980. This summary is included in this section of the report.

Out-of-state students in the State colleges are totaled in the summary since there is no basis for determining the relative popularity of individual institutions with students from other states.

Fourteen county colleges are shown, including Passaic which has not yet officially come into being. Development of Passaic College is recommended since failure to do so would require some 3,000 potential students to travel a considerable distance to congested areas to attend other county colleges. The locations of proposed county colleges will put more than 80% of the State's population within commuting distance of at least one of them.

Union College is not shown but is included among private colleges in this report although its unique financing arrangements make it a semi-public institution.

Students were divided between commuter and resident to aid in estimating dormitory requirements. Costs of dormitories have not been projected, however, for two reasons. One is that the amount of these facilities depends on college policy regarding off-campus residence of students, and the other is that dormitories can be financed through self-liquidating funds.

Recommended Enrollment Goals
Full-Time Undergraduate Students
Public Institutions, 1975-1980

	Commuter	Resident	Total
NCE	3,100	500	3,600
Rutgers			
New Brunswick	2,225	3,775	6,000
Douglass	860	2,560	3,420
Newark	4,820	530	5,350
Kilmer	2,930	2,850	5,780
Camden	2,330	120	2,450
Total (Includes Out-of-State)	13,165	9,835	23,000
State Colleges			
Glassboro	3,300	2,200	5,500
Jersey City	3,500	500	4,000
Montclair	4,200	2,500	6,700
Newark	4,900	500	5,400
Paterson	3,400	700	4,100
Trenton	3,400	3,900	7,300
New - South	2,200	1,800	4,000
New - North	4,400	1,400	5,800
Total	29,300	13,500	42,800
Out-of-State Students	-	1,900	1,900
Total - All Students	29,300	15,400	44,700
County Colleges			
Morris			3,200
Bergen			6,500
Essex			7,000
Passaic			3,000
Burlington			1,700
Mercer			3,000
Middlesex			4,000
Monmouth			2,800
Ocean			1,500
Somerset			2,500
Atlantic			1,100
Cumberland			1,000
Camden			3,500
Gloucester			1,200
Total			42,000
GRAND TOTAL			113,300

IX. UNDERGRADUATE DEMAND IN SPECIAL FIELDS

This section of the report deals with certain subdivisions of undergraduate demand. Particular attention is given to engineering because of proposals that have been made to enlarge capacity for engineering studies. A section has also been devoted to teacher education because of the large enrollment increase planned for the State colleges, which previously have been concerned mostly with teacher training.

Engineering

At present New Jersey is relatively better prepared to provide education in engineering than in most other fields.

The following table shows New Jersey's share of total earned degrees in the United States by field and by level for 1964-1965:

Field of Study	Bachelors and 1st Professional	Masters	Doctors
All Fields	2.48	2.38	2.36
Agriculture	1.98	1.47	4.39
Architecture	.56	3.75	-
Biological Sciences	2.23	1.75	2.49
Business and Commerce	3.09	2.50	-
Education	2.47	2.60	1.29
Engineering	3.27	3.73	2.45
English and Journalism	2.76	1.10	1.98
Fine and Applied Arts	.95	.54	.47
Health Professions	1.15	1.26	2.31
Law	1.69	-	-
Mathematical Subjects	2.12	2.97	2.35
Physical Sciences	2.29	2.62	3.29
Social Sciences	2.65	1.90	1.76
All Other	2.51	2.08	3.35

(Figures represent New Jersey's percentages of United States total.)

New Jersey has in the Newark College of Engineering one of the country's largest engineering schools and sizable contributions are made by the other engineering schools as is illustrated by this listing of engineering degrees conferred in 1965-1966:

	Bachelors	Masters	Doctoral
Public			
NCE	603	177	3
Rutgers	122	32	5
Private			
Fairleigh Dickinson	154	-	-
Monmouth	20	-	-
Princeton	95	102	43
Stevens	174	141	11
Total	1, 168	452	62

The role of graduate engineering education will be described later in this section.

At the undergraduate level engineering has been declining in popularity with college students for several years. Many reasons have been advanced to explain this change and further speculation might be provided, but the emphasis here is on projecting this important trend rather than accounting for it. That there should be a decline in engineering interest during a period of great expansion in the contribution of technology to society may seem strange. As will be noted, there is already unused capacity.

Exhibit 17 shows for the country as a whole a decline in engineering students as a percentage of all male freshmen at four-year institutions from almost 24% to less than 14% in the space of 10 years. During this period the number of male freshmen has gone up sharply, reaching almost 580,000 in 1967. The result of these trend lines is a remarkably stable number of freshmen in engineering. During the period 1957-1967 the number has varied between 65,000 and 79,000, including a small number of part-time students.

Projections made by the Engineering Manpower Commission of the Engineers Joint Council have been used as the basis for the figures on Exhibit 17. Present trends are expected to continue and result in slow growth in freshman engineering enrollment to about 86,000 by 1975. This is a 13% increase over 1967, contrasting with an expected 25% increase in total male entering freshmen.

The Engineers Joint Council foresees a shortage of engineers on the basis of the projections, which are in line with other predictions. The degree of shortage may be overstated but it is evident that further steps will have to be taken to draw young people into technical work at all levels and to use technical people more effectively.

Based on the projected 220,000 total enrollment for New Jersey in 1975-1980 adjusted to include only male, four-year college enrollment, the number of full-time engineering students will be about 10,000. Present plans of the two State-supported engineering schools call for enrollments of 3,400 at Newark College of Engineering and 900 at Rutgers.

If these goals are met the remaining 5, 700 students will attend either the four New Jersey independent engineering schools or schools outside the State. This will be close to the pattern of the over-all plan proposed for the State public institutions, which are expected to take 49% of total enrollment.

Enrollment could be further expanded at either Newark College of Engineering or Rutgers with little or no addition of facilities to accommodate any added demand that might appear. Moreover there probably will be added capacity at some of the private institutions.

Because of the outlook, construction of an additional engineering school or the addition of a costly engineering curriculum at a State college is not recommended for the period to 1980. Instead, New Jersey public institutions should be expanded to take undergraduate engineers only in line with the modest plans mentioned. The private engineering schools should also expect little growth although this may be increased by the drawing power of their own unique programs. Should added demand develop, all schools could enlarge their facilities. If the State-supported schools find their capacity overtaxed by 1975-1980, which seems unlikely, contract arrangements for State support at private colleges should first be investigated.

Because of their interrelationships, it is important to mention graduate level engineering in this section devoted mainly to undergraduate enrollment. Graduate enrollment has been growing considerably faster and in a recent year was 18% of the combined total engineering enrollment compared with about 11% in the early 1950s. Much of this increase is at the masters level, which to a great extent represents the way in which working engineers improve and modernize their skills. Nearly 55% of masters level engineering enrollments are part-time, a further reflection of the high proportion of working engineers. For comparison, 27% of doctorate enrollment is part-time and only 14% of undergraduate enrollment. The importance to industry of having such part-time graduate level education available is considerable. This service should be expanded, but this can generally be accomplished within facilities used for full-time instruction.

Public School Teacher Supply and Demand

One of the basic responsibilities of a higher education system is to offer a curriculum to train elementary and secondary school teachers. Because of this responsibility it becomes important to know what demands will be placed upon the State colleges in the future.

Principal findings and conclusions are summarized as follows:

1. The total number of teachers needed in elementary and secondary schools, both public and private, will increase steadily in the years ahead. However, teacher retention and turnover rates are such that demand for beginning teachers, which has been on a plateau since reaching a peak in 1966, will decline starting in 1969.

2. Enrollments in New Jersey State colleges are forecast to increase sharply. Therefore the outlook is for a reversal of the chronic teacher shortage and a condition of adequate supply, if not oversupply, in the next decade.
3. Exceptions may exist in inner-city problem areas, in some rural schools, and in certain specialties where there may be shortages of capable, trained teachers.
4. Historically, the State colleges of New Jersey have educated 40% to 50% of teachers who begin their careers in the State's schools.
5. These colleges now have sufficient facilities not only to educate a comparable share but to accommodate all the education majors needed to staff New Jersey schools in the foreseeable future.

The remainder of this section of the report takes up these findings in more detail. The first step in this part of the project was to determine the total number of in-service classroom and guidance teachers that will be required in each year through 1985. Administrators were not included. With the requirements as a base, the number of beginning teachers needed was calculated and then compared with the forecast supply.

Total Requirements for Teachers

Two factors affecting requirements were considered: enrollment growth in the State's schools and new teaching programs. Yearly enrollment projections prepared in 1968 by the New Jersey State Department of Education indicate that the public school population will grow from the present 1,375,000 pupils to 1,569,000 in the school year 1980-1981. Inasmuch as the enrollment projections are current these figures provide a sound basis for planning.

A ratio of 22 students per teacher was used in determining the number of teachers required. This ratio agrees with actual experience and expected future conditions.

Using estimates made in the State Department of Education's 1966 report, "Imbalances in Teacher Supply in New Jersey", it was forecast by a panel of experienced educators that 2,412 new positions will result from new programs to be developed between now and 1980.

These data indicate that requirements for teachers will grow more slowly in the 1970s than they did in the 1960s. Present requirements for 67,600 positions in September, 1968, will increase to 74,100 in 1975 and to 75,700 in 1980.

The increase, representing additional positions needed, will in fact get smaller year by year. The flattening out of teacher requirements over the next 10 years is due to the fact that the impact of the baby boom following World War II is now over. This trend in demand within the State is comparable to nationwide trends, as provided by the Office of Education and the 1967 report of the President's Commission on Manpower.

Requirements for Beginning Teachers

In determining demand for beginning teachers, consideration had to be given to expected attrition, re-entry of teachers into the State system, and other factors.

New Jersey has been experiencing an over-all 13% turnover rate of elementary and secondary teachers each year excluding teachers who move from one part of the State to another. As a result, 87% of the previous year's work force was projected as the continuing supply in each year.

Offsetting the attrition, in part, are teachers who enter the State system from other kinds of teaching positions, leaves of absence, military service, or employment in non-teaching positions. These teachers have not taught in the New Jersey system the prior year or have taught only as substitute teachers. Historically, a number equal to 8% of the previous year's work force in New Jersey has entered the system each September from these sources.

Both the New Jersey turnover and "re-entry" rates have been higher than the national averages of about 8% attrition and 3% re-entry. However, the difference, which results in a yearly net loss of 5%, matches the over-all United States experience.

A range of 4% to 6% net loss would be a realistic projection for planning purposes.

Each fall newly graduated teachers have to fill the gap between the net available work force and the total number of positions. In the 1966-1967 school year, there were 5,500 beginning teachers in a total force of 62,900. Forecasts indicate that the demand will drop to 5,300 beginning teachers in September, 1969. Thereafter demand will decline further and then level off in the 4,000-to-4,300 range during the 1970s. There will be a reduced requirement for beginning teachers even though total teaching positions will increase yearly, because the need for newly created positions will diminish.

Exhibit 18 depicts the trend of requirements for beginning teachers each year through 1980. For planning purposes, minimum figures based on a 4% net loss of teachers and maximums based on a 6% effective loss were developed. These upper and lower bounds allow for realistic variations from expected needs in any one year.

Supply of Teachers

After examination of data on current education graduates and future demand, it is concluded that the State college system already has the facilities to accommodate sufficient numbers of education majors.

The various sources of supply of the 5,500 beginning teachers in New Jersey for the school year 1966-1967 were:

New Jersey State Colleges	2,682	49%
Other New Jersey Public Colleges	342	6
New Jersey Private Colleges	501	9
Out-of-State Colleges	1,959	36
Total	5,484	100%

Examination of regular certificates issued in 1967 indicates that Seton Hall and Fairleigh Dickinson were the sources of half the teachers attending private colleges within the State. By far the greatest number of beginning teachers who received degrees out of the state attended colleges in Pennsylvania and New York.

In the recent past the six State colleges have provided from 2,700 to 2,800 beginning teachers a year for the public school system while graduating an average of 4,800 annually. Since requirements in 1980 are only 4,000 as shown on Exhibit 18, it is clear that the six colleges alone could furnish all the beginning teachers needed if it proved necessary. With the other public and private colleges in the State, they have ample capacity to meet teacher requirements through the period under study.

Non-public elementary and secondary schools enroll about 20% of New Jersey's total pupils. Their needs will be in addition to those stated here for public schools but not in proportion since some of their teachers come from other sources and pupil/teacher ratios tend to be larger.

It is recognized that certain imbalances will exist. There will be a shortage of teachers in some geographic areas, particularly in cities with low-income districts. It will require special effort to recruit dedicated people to teach in low-income areas. There will also be shortages in certain fields, such as teaching of the handicapped.

Another area of imbalance is likely to continue in southern New Jersey, where it has been difficult to obtain teachers for rural schools. Such steps as establishing teacher education facilities in the southern part of the State and increasing salaries, together with the growing urbanization of that area, will help to alleviate the imbalance.

Taken as a whole, the outlook for teacher supply is favorable. Therefore it is recommended that as the State colleges increase their capacity major emphasis be placed on expansion in fields other than teacher training.

X. DEMAND FOR GRADUATE-LEVEL EDUCATION

The amount of graduate work being done in New Jersey colleges and universities at the present time is considerably less than might be expected from a state of its size and advancement. About 6,350 full-time graduate students were enrolled in all the State's public and private institutions in 1967-1968.

Exhibit 19, covering selected states, shows that New Jersey's total of masters and doctors degrees awarded is about 2.5% of the national total. The State's population is about 3.5% of the total for the country as a whole. The industrial character of the State and its extensive research complexes suggest that its share of higher degrees should be even greater than its percentage of population would indicate. A theoretical "fair share" for the State would call for current enrollment of about 4% of the nation's total, or 15,000 full-time graduate students.

The next step was to calculate a fair share for the 1975-1980 period and determine whether it represented a reasonable goal.

Planning for graduate-level education proceeded on a different basis than that for undergraduates. Broadly speaking, it can be said that a state does not have the obligation for providing graduate education for its residents that it does for providing undergraduate education. The reason for this is that graduate students are highly mobile and less easy to identify with a state of origin than undergraduates. Furthermore, full-time graduate students are less likely than undergraduates to be drawn to a college or university that is near by.

Two other considerations are that universities usually develop graduate programs on the basis of their strengths in certain departments and that enrollment in graduate schools usually bears some relationship to undergraduate enrollment.

A calculation was made to provide another estimate of the number of full-time graduate students that should be provided for in New Jersey universities. It was based on the number of students from New Jersey who are now taking graduate work. Since the mobility of graduate students often makes it difficult to define what state actually is home, a statistical relationship was established between graduate and undergraduate enrollments for the purposes of this calculation. By this means it was estimated that if in 1967 there were 139, 700 undergraduate students of New Jersey origin there would have been about 14, 000 full-time graduate students from New Jersey.

Calculations such as these can provide some guidelines in setting goals for graduate education. With the aid of such guidelines, a pattern of graduate enrollment demand was developed to serve as the basis for calculating the graduate facilities that will be needed.

The pattern is as follows:

Graduate Enrollment Pattern

	1967		1975-1980	
	Full-Time	Part-Time	Full-Time	Part-Time
Rutgers	2,700	2,800	6,400	4,300
NCE	100	900	150	1,200
State Colleges	150	10,000	4,450	12,000
Total Public	2,950	13,700	11,000	17,500
Private Institutions	3,400	6,400	5,000	10,000
Total State	6,350	20,100	16,000	27,500

The 16,000 full-time graduate students would still be well below the theoretical New Jersey fair share since 4% of the expected national total is 26,000. However, this enrollment would be two-and-a-half times the number enrolled in the past academic year and would represent a major advance in New Jersey higher education.

The graduate enrollment increases shown for Rutgers and Newark College of Engineering are based on their own well-thought-out plans. The State colleges have had no firm plans and the figure of 4,450 full-time graduate students estimated for the forecast year is based on a desirable relationship between graduate and undergraduate students. It should be noted that an increase of this magnitude in graduate students at the State colleges is a large one to be undertaken at a time when they are planning for a substantial increase in undergraduate enrollments. However, efforts should be made to achieve the goal of developing the State colleges into comprehensive institutions of higher education.

It proved difficult for private institutions to estimate their future graduate enrollment. However, the trend of increase in graduate enrollments at the private colleges is more rapid than it is for undergraduate enrollments and an increase to 5,000 full-time graduate students by 1975-1980 is approximately at the average growth rate in other parts of the country.

A theoretical method of planning for graduate enrollment is to relate it to the needs of the State's industries and professions for highly educated personnel. However, there appears to be little correlation between the location of graduate schools and the distribution of their alumni since employers commonly recruit from graduate schools over a large area. As an example, although New Jersey ranks low in the number of graduate degrees awarded, the State has one of the highest densities of scientists in the country, as shown in the following table:

Number of Scientists Per 1,000 Population
Selected States, 1964

Total United States	1.6
Maryland	2.0
Massachusetts	1.8
New Jersey	1.8
California	1.5
New York	1.4
Illinois	1.1
Pennsylvania	1.1
Ohio	1.0
Texas	1.0
Michigan	.9

Source: "American Science Manpower"
National Science Foundation

Scientists are drawn to New Jersey by the opportunities that exist in industry and research and the relatively high level of salaries. Referring again to "American Science Manpower - 1964", the median annual salary of full-time employed civilian scientists in New Jersey is $1, 000 above the national average, equal to or above that in all but three states.

Needs for Medical and Dental Education

A special study of New Jersey's needs for medical and dental education was made and is discussed in the Robert Heller Associates report of 19 January 1968 that was submitted to the New Jersey Council on Medical and Dental Education and to the New Jersey State Commission for the Higher Education Facilities Act of 1963.

In carrying out this work, meetings were held with personnel of the existing medical and dental schools, including the New Jersey College of Medicine and Dentistry, Fairleigh Dickinson School of Dentistry, and the Rutgers School of Medicine. Their present enrollments, expansion plans, and capital requirements were examined.

Current New Jersey and national needs, as well as trends in medical and dental care and education, were studied.

Interviews were conducted with knowledgeable people in the American Medical Association, American Dental Association, United States Public Health Service, Association of American Medical Colleges, the Hospital Survey Committee (Philadelphia), and others.

Studies of health needs in other states, particularly Pennsylvania and Wisconsin, were reviewed.

On the basis of this work, conclusions reached were as follows:

1. In the case of medical schools, New Jersey should concentrate available funds on the two existing schools, both of which are relatively new and will require heavy investment before they reach full potential. Benefits to the State will be greater if available funds are not diverted for the establishment of new medical or dental facilities elsewhere in the State.
2. Consideration of a third medical school should be reviewed in the mid-1970s when a decision to start a medical school would have to be made if it were to become available by the early 1980s. Such a school could be established if need for further increases beyond those now planned were determined.
3. National needs for medical-dental education will probably never be completely satisfied. Nevertheless, planned programs of expansion throughout the country seem adequate to reach acceptable goals for 1975-1980.
4. Although New Jersey is presently carrying less than its proportionate share of medical education in the United States, its share of the national total will increase as a result of the growth programs planned by the New Jersey College of Medicine and Rutgers School of Medicine.

5. Improvement of medical and dental care for its citizens is not in itself sufficient reason for establishing new medical-dental schools in New Jersey. There is little direct correlation between the amount of medical-dental education in a state and the number of doctors and dentists practicing in it. New Jersey ranks high in the ratio of doctors and dentists to population. Furthermore, most of the residents of New Jersey have easy access to the great medical centers of New York City and Philadelphia.
6. Improvement of medical-dental educational opportunities for its students is similarly not a compelling reason for establishing new schools in New Jersey. In comparison with other states, a relatively high percentage of New Jersey residents attend medical and dental schools.
7. It will also be timely in the mid-1970s to review dental education. However, since the State comes close to carrying its share of the national load, there is little likelihood that a new dental school will then be required. Meanwhile it is, of course, important that presently established dental schools continue to operate and expand as planned.
8. Expansion in the training of nurses and of medical and dental technical aides must take place. This will allow continued growth of productivity and effectiveness of both physicians and dentists.

Capital requirements for expansion of the medical and dental schools and projected sources of capital are dealt with in the final section of this report.

XI. FACILITIES AND CAPITAL REQUIREMENTS

There will be need in 1975-1980 for 113,300 places for undergraduate students in New Jersey public colleges and universities, including 4,300 out-of-state students. In addition, space should be provided for 11,000 graduate students.

This section of the report describes how the facilities required to accommodate this enrollment were determined. Essentially, this was done through the use of "space planning modules". A certain amount of space, both academic and supporting, is needed for each student and the amount, termed a module, varies according to courses taken and other factors. Modules established for each type of student can be multiplied by the number of students to be accommodated to determine total space required. The square feet required by each student can also be multiplied by space cost per square foot to arrive at a capital cost per student.

Appendix C describes the calculations made to develop the modules. Exhibit 20 illustrates four examples of planning modules.

As shown on the exhibit, four basic factors influence the planning modules:

1. Student level.
2. Curriculum.
3. Residence status.
4. Type of institution.

By way of example, the undergraduate education student who commutes to a public college differs from the undergraduate education student who is resident in the same college only in the amount of dining, lounge, and recreation space required. The education undergraduate differs from the engineering undergraduate in the amount of class laboratory space required while the engineering undergraduate differs from the engineering graduate primarily in the increased amounts of space allotted for research, faculty offices, library, and recreation.

The planning modules were developed after detailed analysis of the major private and public colleges in the State of New Jersey and investigation of standards used in other states. It should be emphasized that the modules were designed for planning purposes and do not necessarily indicate the particular needs of any one college.

The module shows per-student space requirements in net square feet. This is the area in each building which is available for use by a student. Before a cost-per-student can be calculated, the net square feet must be converted into gross square feet to take into account "architectural space" occupied by mechanical systems, corridors, lobbies, inside walls, and the like. While there are differences in "net to gross ratios", depending on types of construction and function of the building, an over-all average of 60% net to gross is a good ratio for planning and was used to determine gross square footage requirements.

A cost per gross square foot was then applied to each category of space as illustrated in Appendix C.

The cost of building space varies according to the type of space and also, in New Jersey, by geographical area of the State since construction costs are generally higher in the northeast than in other parts of the State. Exhibit 21 illustrates cost ranges for each category of space. The upper end of each bar indicates cost per gross square foot in the northeastern part of New Jersey and the lower end indicates costs in the southern area. Costs for central and northwestern portions of the State are indicated in the center part of each bar. Thus, the cost of constructing an average classroom building in northeastern New Jersey is estimated to be $34 per gross square foot, in 1968 dollars, and $27.50 in the south. These are average costs and do not necessarily apply to any one specific building. Appendix D is a further discussion of costs.

The cost figures represent project costs which include construction, site preparation, utility connections, fixed equipment, fees, legal and administrative expense, contingencies, and interest during construction. Land cost is not included.

Also included in Exhibit 21 is a priority list of construction indicating the order in which buildings are needed to accommodate enrollment increases. Classrooms and laboratories, for example, are essential before additional students can be enrolled. However, assembly areas and research facilities, while of value for a well-rounded education, are less critical and therefore are assigned lower priorities.

When the three primary factors - enrollment, square feet needed per student, and cost per square foot - are determined, capital requirements can be calculated. Two methods were considered to calculate these requirements for 1975-1980.

The first of these is a simplified method wherein the calculated capital cost per student is simply multiplied by the projected increase in enrollment to determine the total capital cost. The capital cost per student includes a component for replacement and renovation of existing buildings, but this component is an over-all average figure and it is not related to the needs of a specific institution. The two tables that follow show the capital cost required for undergraduate and graduate students respectively at each class of public institution in the State, as calculated by this simplified method.

Simplified Estimate of Capital Costs for Public Higher Education to Meet Enrollment Demand in 1975-1980

Undergraduate	Enrollment Increase	Cost Per Student	Total Cost ($000)
County Colleges (State Share Only)	36,500	$ 2,747	$ 100,285
State Colleges	24,000	5,259	126,150
Rutgers	9,500	6,166	58,440
Newark College of Engineering	1,000	9,500	9,500
Total			$ 294,375

Graduate	Enrollment Increase	Cost Per Student	Total Cost ($000)
State Colleges	4,300	$10,575	$ 45,480
Rutgers			
Liberal Arts and Education	1,400	12,000	16,800
Science	1,300	16,500	21,450
Engineering	200	25,200	5,040
Agriculture	300	25,500	7,650
Law	500	9,700	4,850
Total	3,700	$15,075	$ 55,790
Newark College of Engineering	50	27,900	1,395
Grand Total	8,050	$12,750	$ 102,665

While the foregoing method is useful in providing an initial estimate of total facilities cost, some refinement is needed to take into account condition of existing facilities and the extent of their utilization.

In the second method, facilities of each college were analyzed individually and an estimate made of new construction required for the 1975-1980 period to adequately handle its specific enrollment demand and replace and renovate existing buildings. Existing buildings were inspected and their capacity to handle enrollment above present demands estimated. Appendix E describes the calculations used to develop the individual college construction costs. Estimated costs of land and general site improvements were then added to the construction cost for each college.

By this method it was determined that about $737.6 million would be required between now and 1975 to meet projected enrollment demand on public colleges and universities during the 1975-1980 period. This includes $406.4 million to accommodate 113,300 undergraduate and 11,000 graduate students. With $165 million for medical and dental education facilities the requirement will be $571.4 million in 1968 dollars.

The effect of inflation has been assumed to add about 5% a year to costs. Compounded annually on the balance remaining to be spent in each year, it will amount to some $99.1 million and bring the total to $670.6 million by 1975. A contingency amount of 10% has been added in the interests of conservatism to provide for unforeseen requirements. The $67 million set aside for this purpose raises the total capital needed to the $737.6 million figure.

As a practical matter, some additional but presently unmeasurable amount of capital must be spent on facilities constructed in the later years of the planning period. This expenditure will provide additional space to handle possible increases in enrollment demand beyond the planning period. The contingency fund will apply toward these expenditures.

Sources of Funds

Of the required capital, $184.5 million has already been appropriated. Nearly all of the funds for medical and dental facilities have been appropriated or obligated by federal, state, or private agencies. Some $59.7 million has already been spent to build county college facilities or has been appropriated through the 1967-1968 and 1968-1969 fiscal period for construction of facilities at State colleges and Rutgers.

It is highly probable that the federal government will continue to make funds available to aid in constructing college and university facilities, both public and private. Although it is impossible to forecast accurately the funds that will be made available to New Jersey public institutions, it is assumed for planning purposes that $27 million of the total required will be provided by federal government sources.

The total capital requirement includes $53.3 million for income-producing facilities such as dining halls. The State may elect to finance such facilities on a self-liquidating basis through, for example, the New Jersey State Educational Facilities Authority. (As noted previously, the cost of dormitory construction has not been included in these estimates of capital requirements since it has been assumed that they will be financed on a 100% self-liquidating basis.)

When the foregoing amounts have been deducted from the total, there remains an estimated $472.8 million that will have to be appropriated by the State if the challenge of the enrollment increase projected for the 1975-1980 period is to be met.

The table that follows summarizes the capital requirements and the sources of funds that have been projected.

Capital Requirements and Sources
($000)

	Colleges and Universities	Medical and Dental Colleges	Total
Requirements			
Basic Capital Requirements:			
County Colleges	$120,575		
State Colleges	168,023		
Rutgers	108,735		
NCE	9,106		
Sub-Total	$406,439	$165,000	$571,439
Provision for Inflation at 5% Annually	72,040	27,100	99,140
Sub-Total	$478,479	$192,100	$670,579
Provision for Contingency at 10%	47,848	19,210	67,058
Total Capital Requirements	$526,327	$211,310	$737,637
Sources			
Prior State Appropriations	$ 46,183	$ 25,300	$ 71,483
Prior Obligations, Federal, State, and Private	13,600	99,500	113,100
Anticipated Future Federal Appropriations	27,000	-	27,000
Self-Liquidating Loans Income-Producing Facilities	53,271	-	53,271
Needed State Appropriations	386,273	86,510	472,783

EXHIBITS

Exhibit 1

See p. 21

ENROLLMENT OF NEW JERSEY RESIDENTS FULL-TIME UNDERGRADUATE STUDENTS 1963-1967

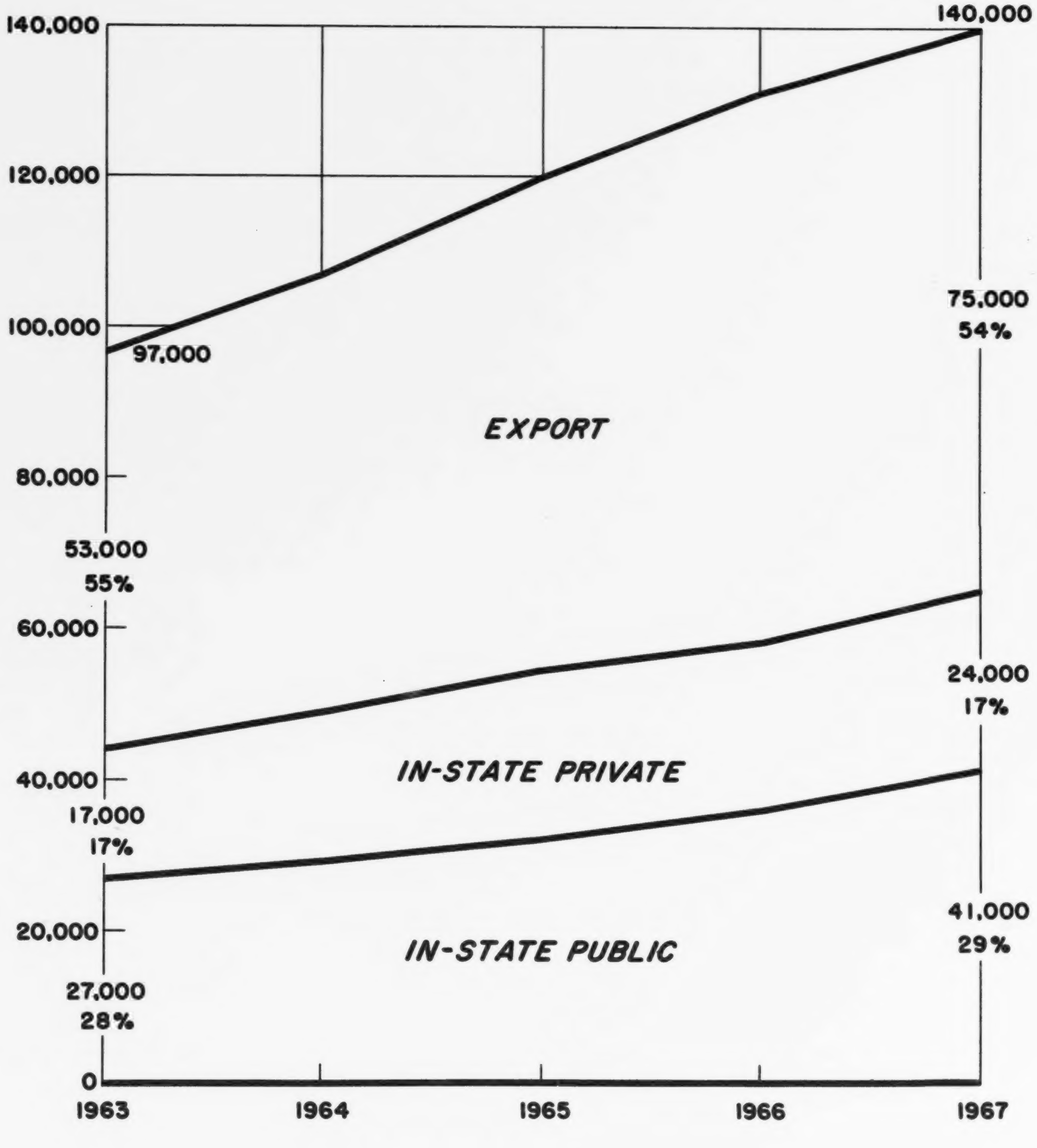

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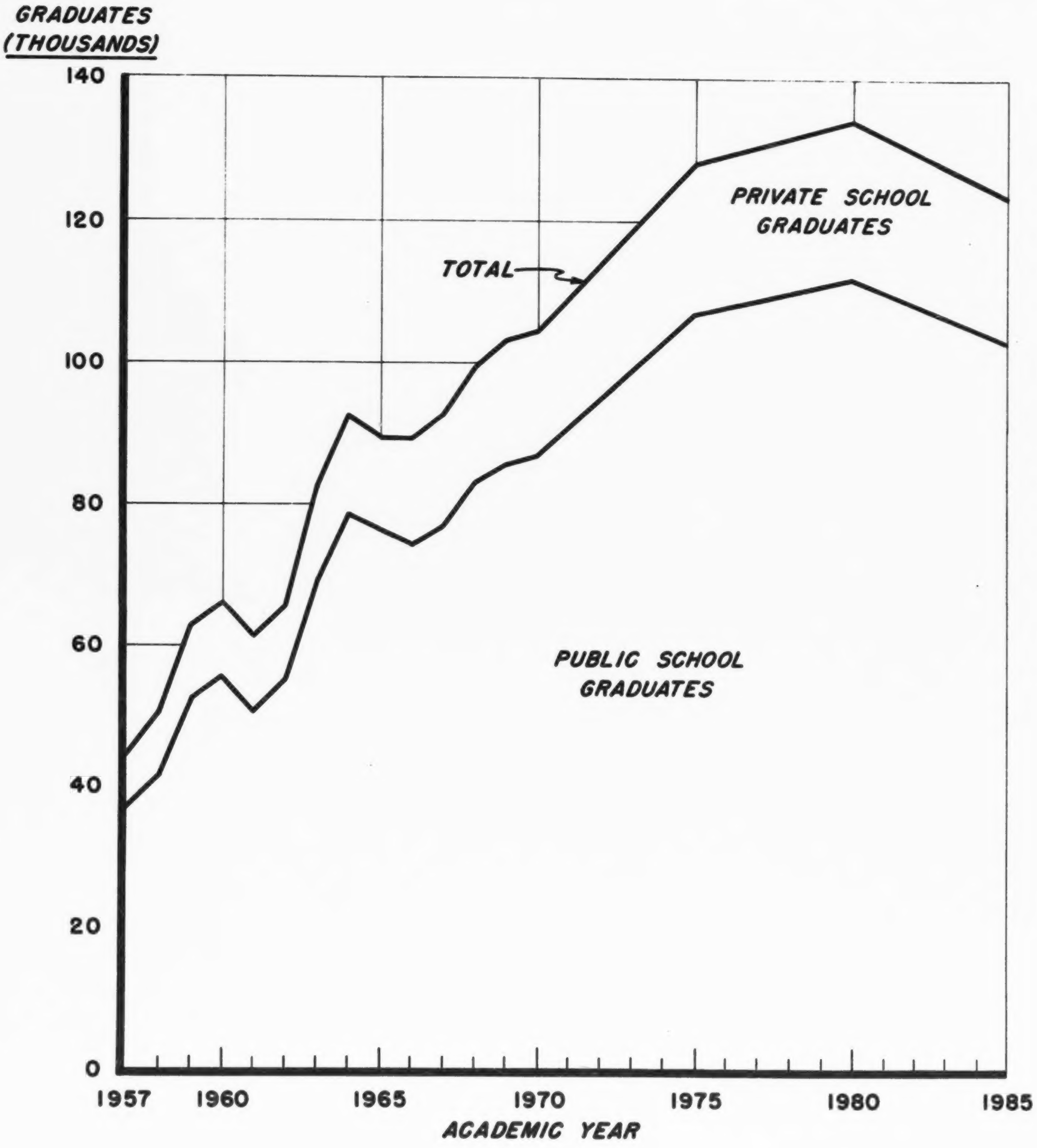
Exhibit 2

See p. 23

NEW JERSEY HIGH SCHOOL GRADUATES PUBLIC AND PRIVATE SCHOOLS 1957-1985

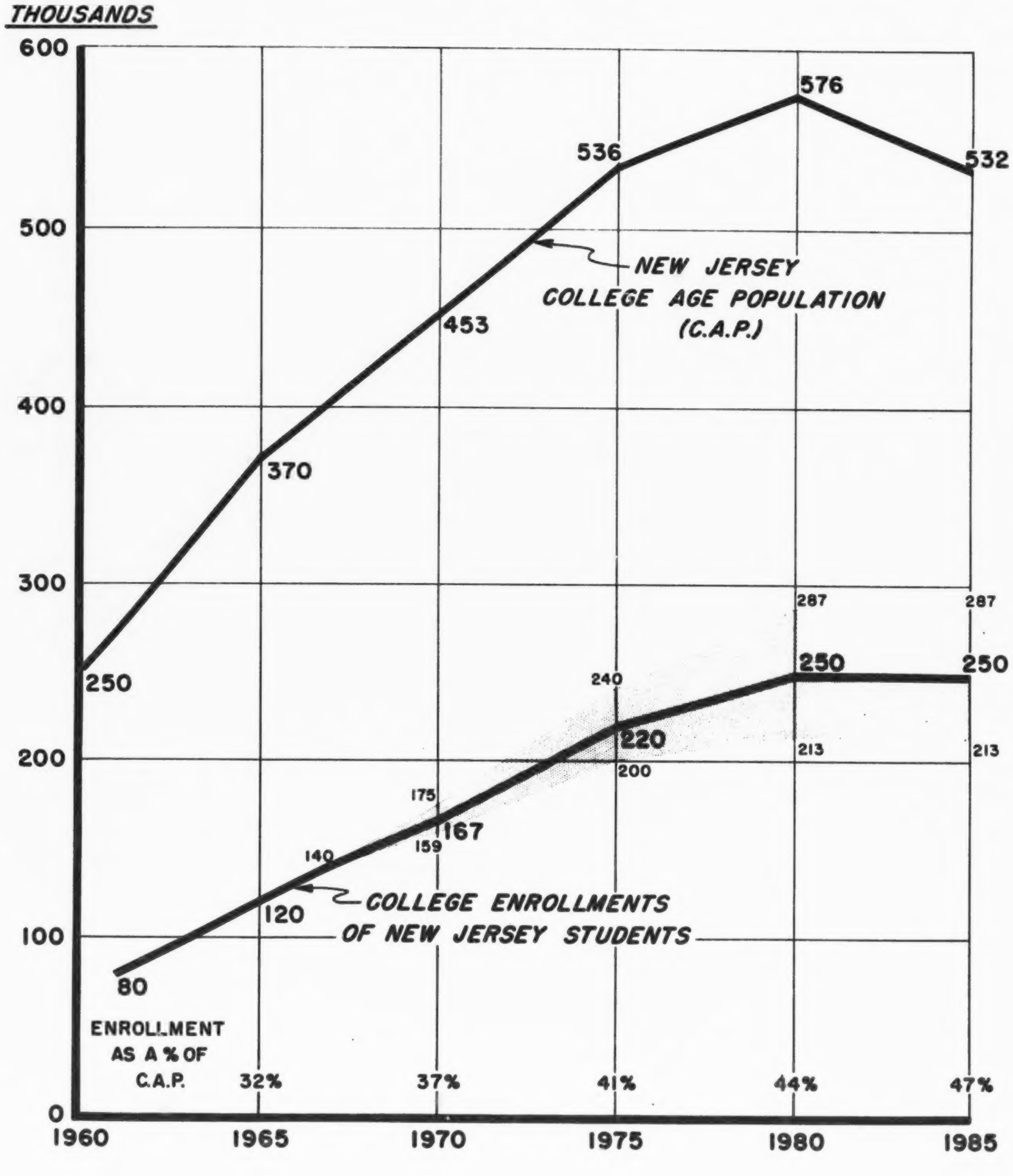


SOURCE: NEW JERSEY DEPARTMENT OF EDUCATION
RHA

Exhibit 3

See p. 23

NEW JERSEY COLLEGE AGE POPULATION (18-21) AND FULL-TIME UNDERGRADUATE ENROLLMENTS
1960-1985



COLLEGE ATTENDANCE PATTERN BY
ALL NEW JERSEY HIGH SCHOOL
CLASS OF 1966

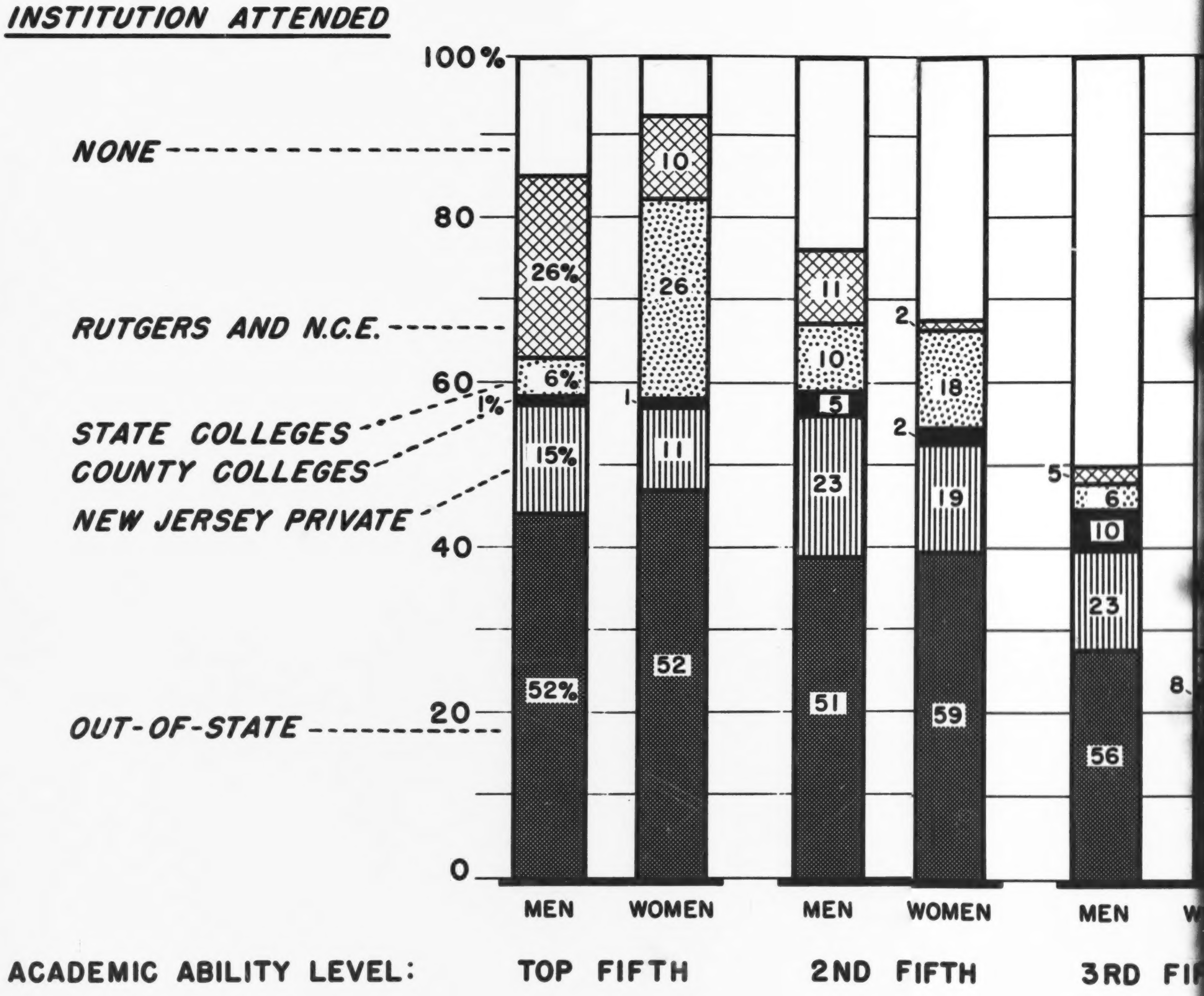


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Exhibit 4
See pp. 26,27,28

Y ABILITY LEVEL
L GRADUATES

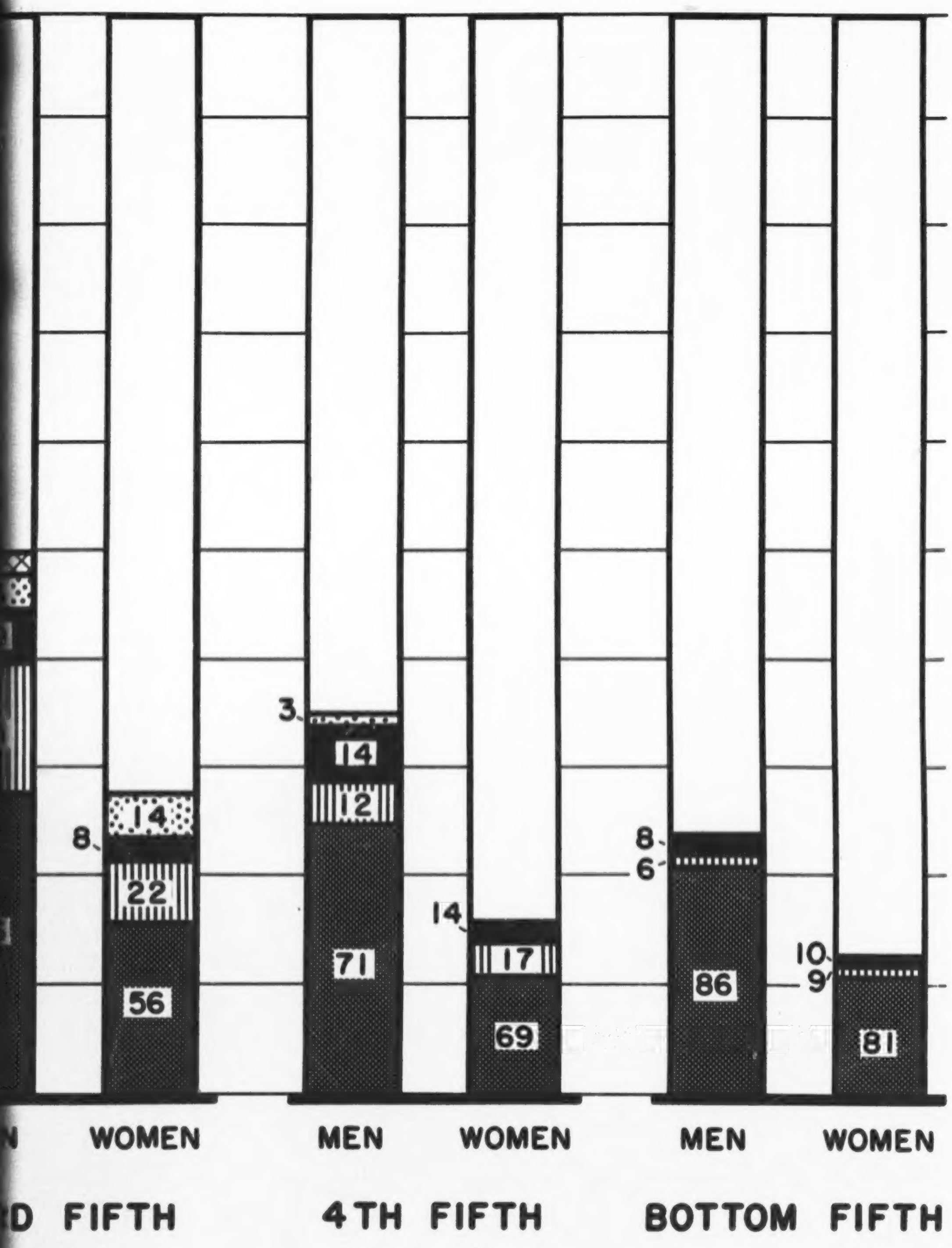
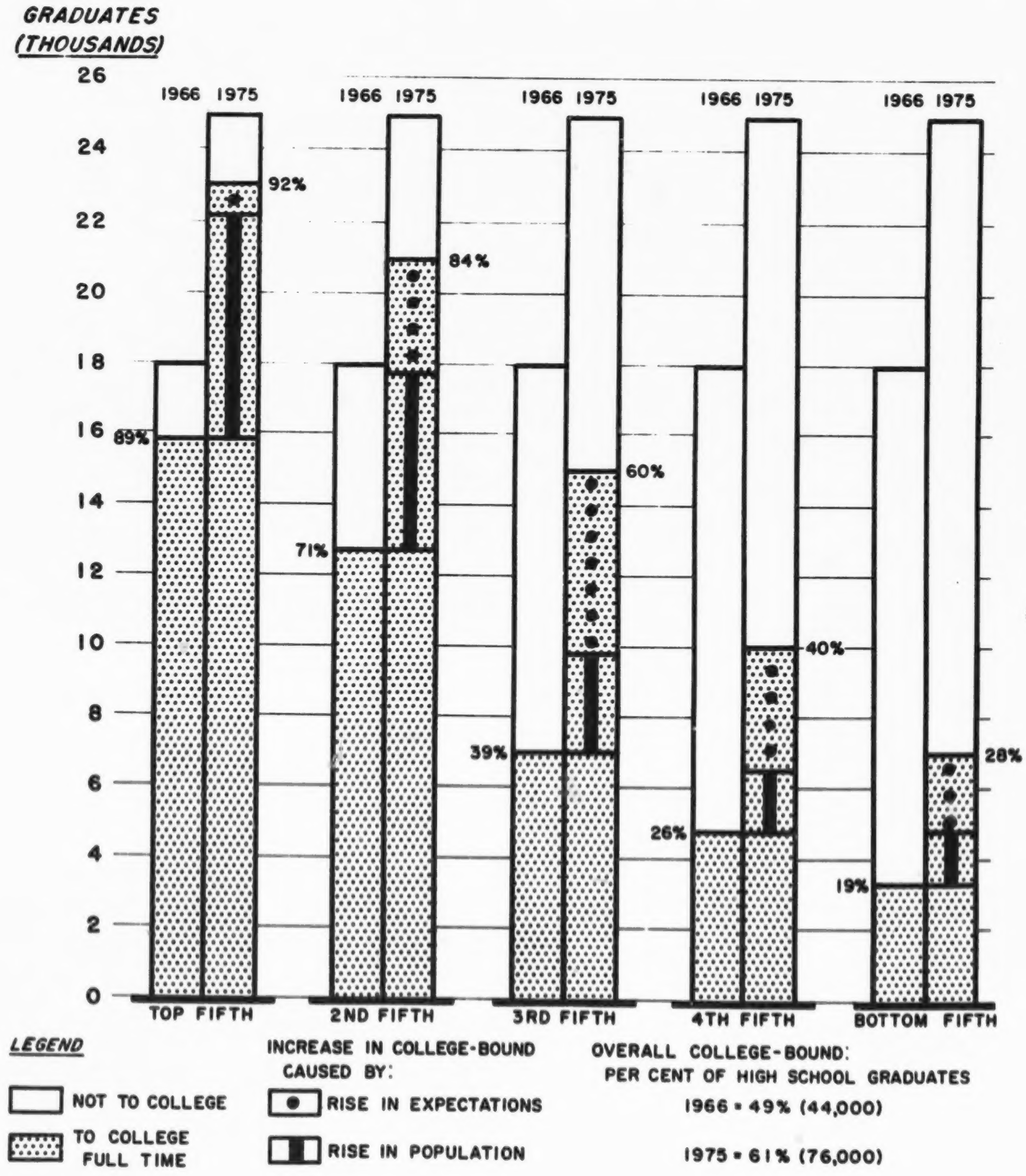


Exhibit 5
See p. 27

DISPOSITION OF NEW JERSEY PUBLIC AND INDEPENDENT HIGH SCHOOL GRADUATES BY ACADEMIC ABILITY LEVEL
1966 AND 1975

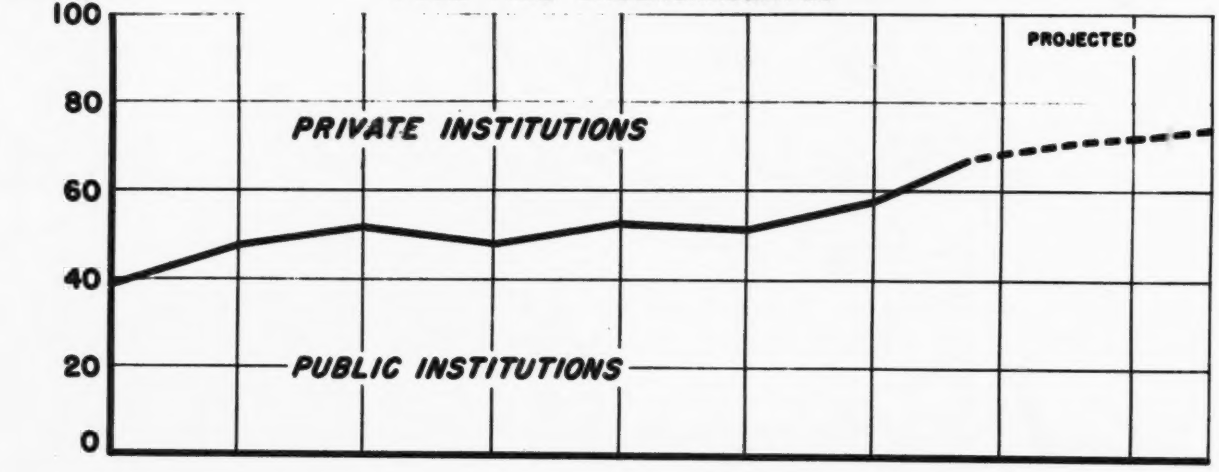


SOURCE: RHA ESTIMATES

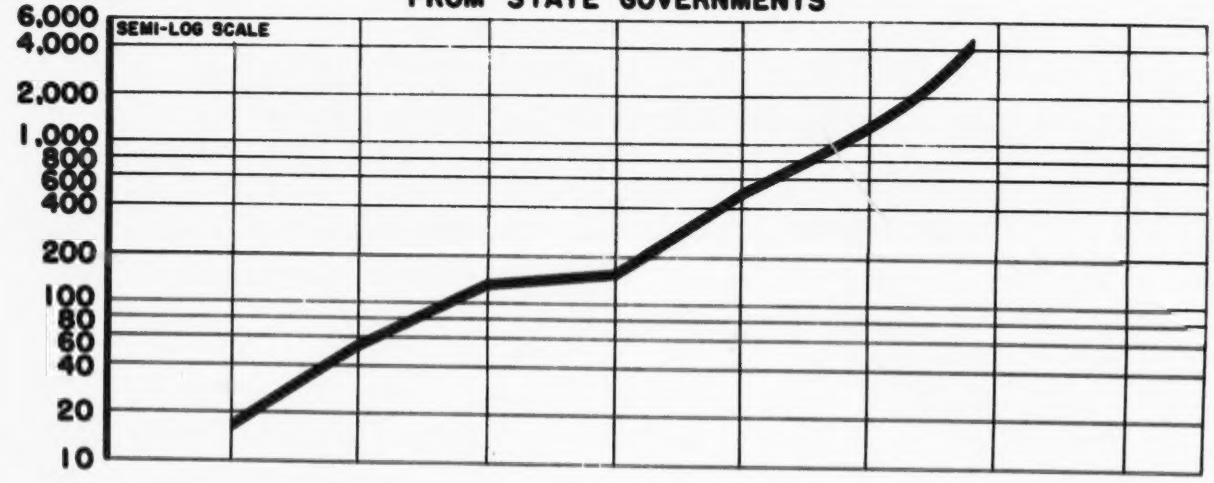
Exhibit 6
See p. 30

ENROLLMENT AND FINANCIAL TRENDS UNITED STATES COLLEGES AND UNIVERSITIES

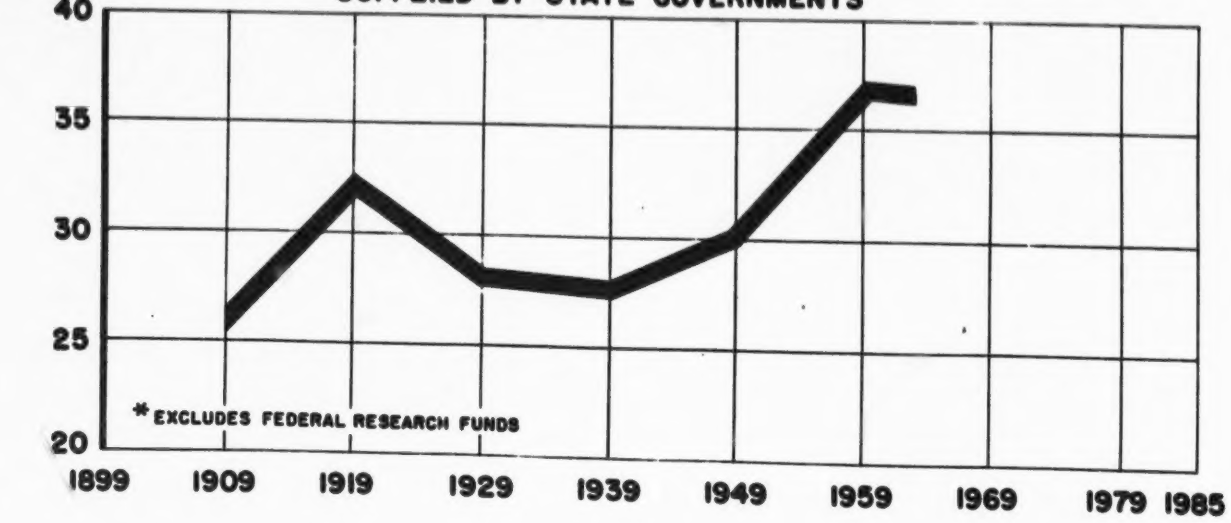
PER CENT OF TOTAL U.S. ENROLLMENT
FULL-TIME UNDERGRADUATES



CURRENT-FUND INCOME
FROM STATE GOVERNMENTS



SHARE OF COLLEGE AND UNIVERSITY INCOME*
SUPPLIED BY STATE GOVERNMENTS

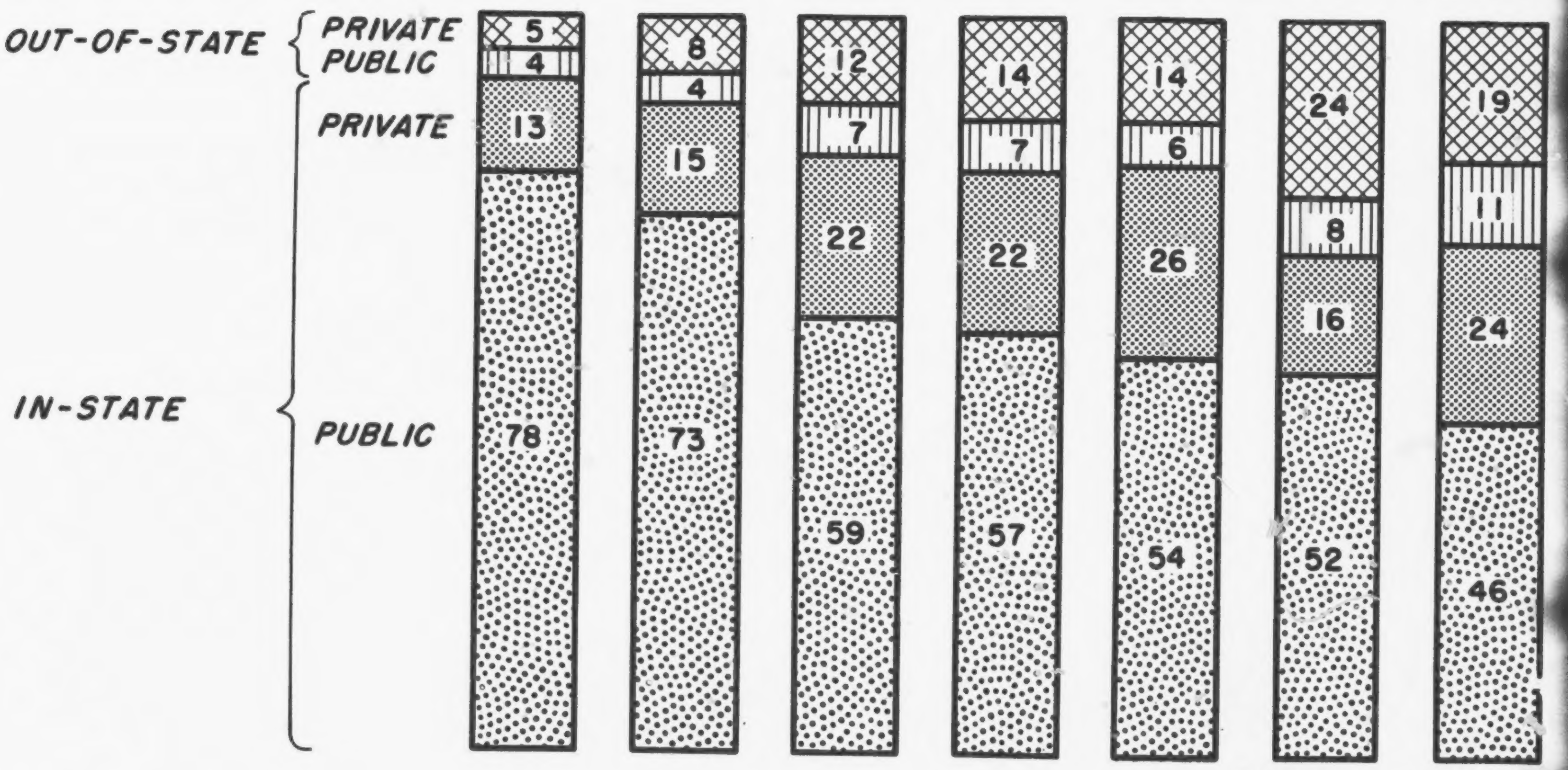


*EXCLUDES FEDERAL RESEARCH FUNDS

COLLEGE ENROLLMENT PATTERNS AN
UNITED STATES AND SELECTED ST

	CALIF.	MICH.	IND.	U.S.	OHIO	MD.	ILL.
1965 POPULATION (000)	18,403	8,317	4,893	193,795	10,241	3,534	10,641
1965 PER CAPITA INCOME	$ 3,258	3,010	2,846	2,746	2,829	3,001	3,280
1965 VALUE ADDED BY MANUF. (000,000)	$18,959	16,885	9,306	226,974	18,348	3,380	17,716

PER CENT DISTRIBUTION OF FULL-TIME UNDE



TUITION AND FEES

	CALIF.	MICH.	IND.	U.S.	OHIO	MD.	ILL.
AVG. $ PER STUDENT - 1964	$ 274	455	603	541	710	666	634
EST. $ PER STUDENT - 1966	$ 282	469	624	560	734	691	658
AVG. STATE SCHOLARSHIP PER STUDENT - 1966	$ 14	26	3	18	29	35	26
ADJ. $ PER STUDENT - 1966	$268	443	621	542	705	656	632

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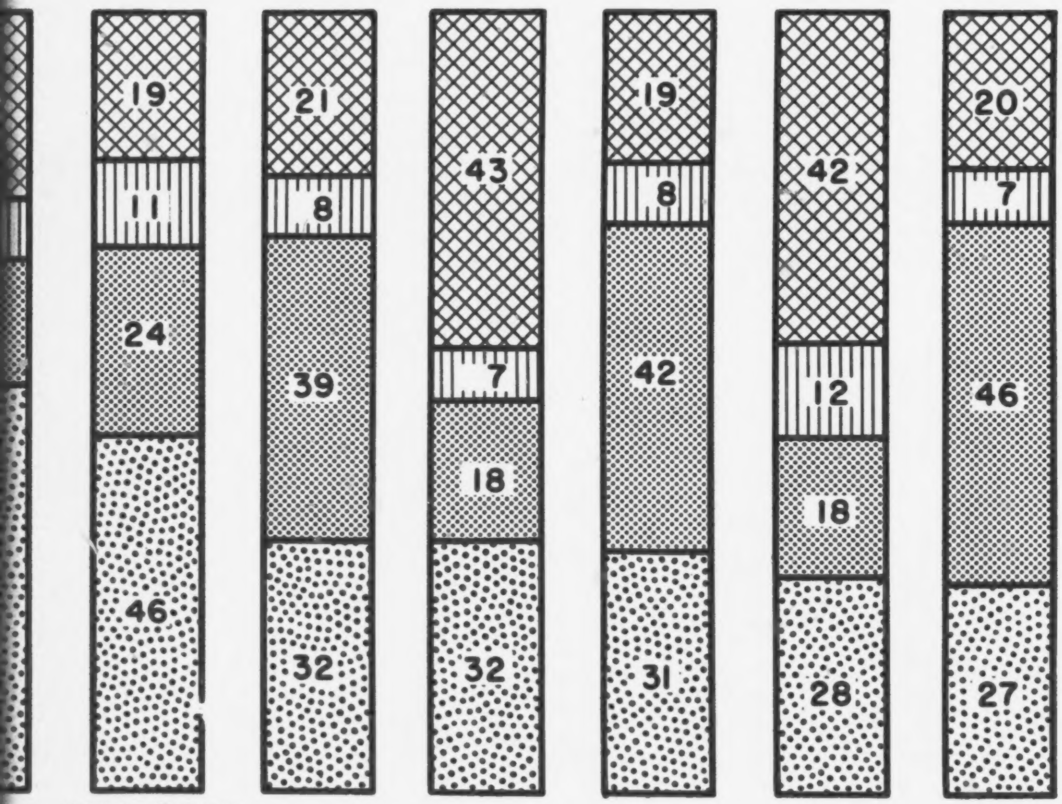
Exhibit 7

See pp. 30,31

RNS AND COSTS
TED STATES

.	ILL.	N.Y.	CONN.	PA.	N.J.	MASS.
34	10,641	18,106	2,830	11,583	6,781	5,361
01	3,280	3,278	3,401	2,747	3,237	3,050
80	17,716	22,820	5,295	17,062	11,298	7,449

-TIME UNDERGRADUATE STUDENTS



N AND FEES

ILL.	N.Y.	CONN.	PA.	N.J.	MASS.
634	959	909	915	933	1,029
658	995	949	948	973	1,068
26	86	6	66	39	4
632	909	943	882	934	1,064

C.
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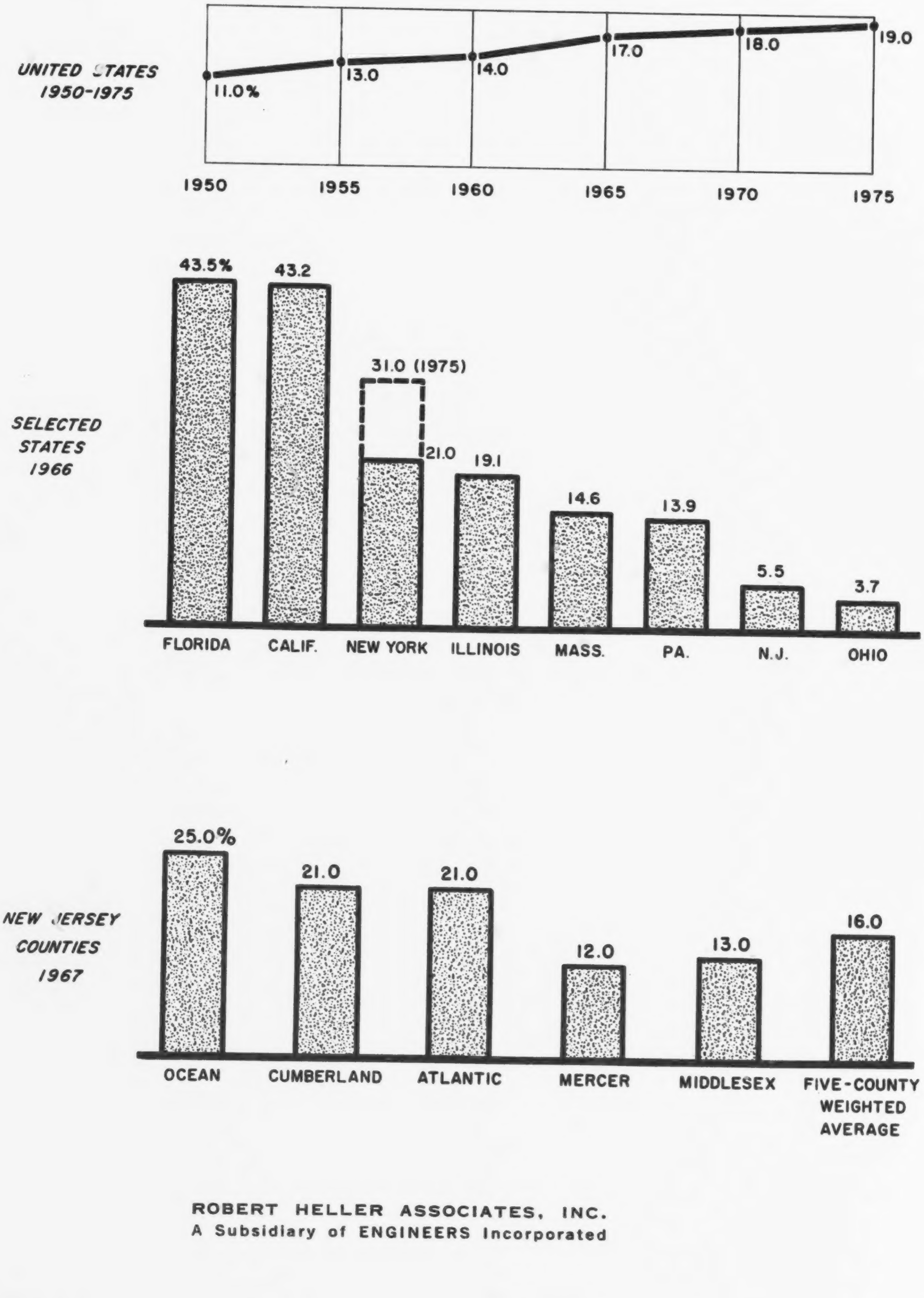
Exhibit 8
See pp. 39,40,41

PERCENTAGE OF TOTAL UNDERGRADUATE ENROLLMENT IN 2-YEAR COLLEGES

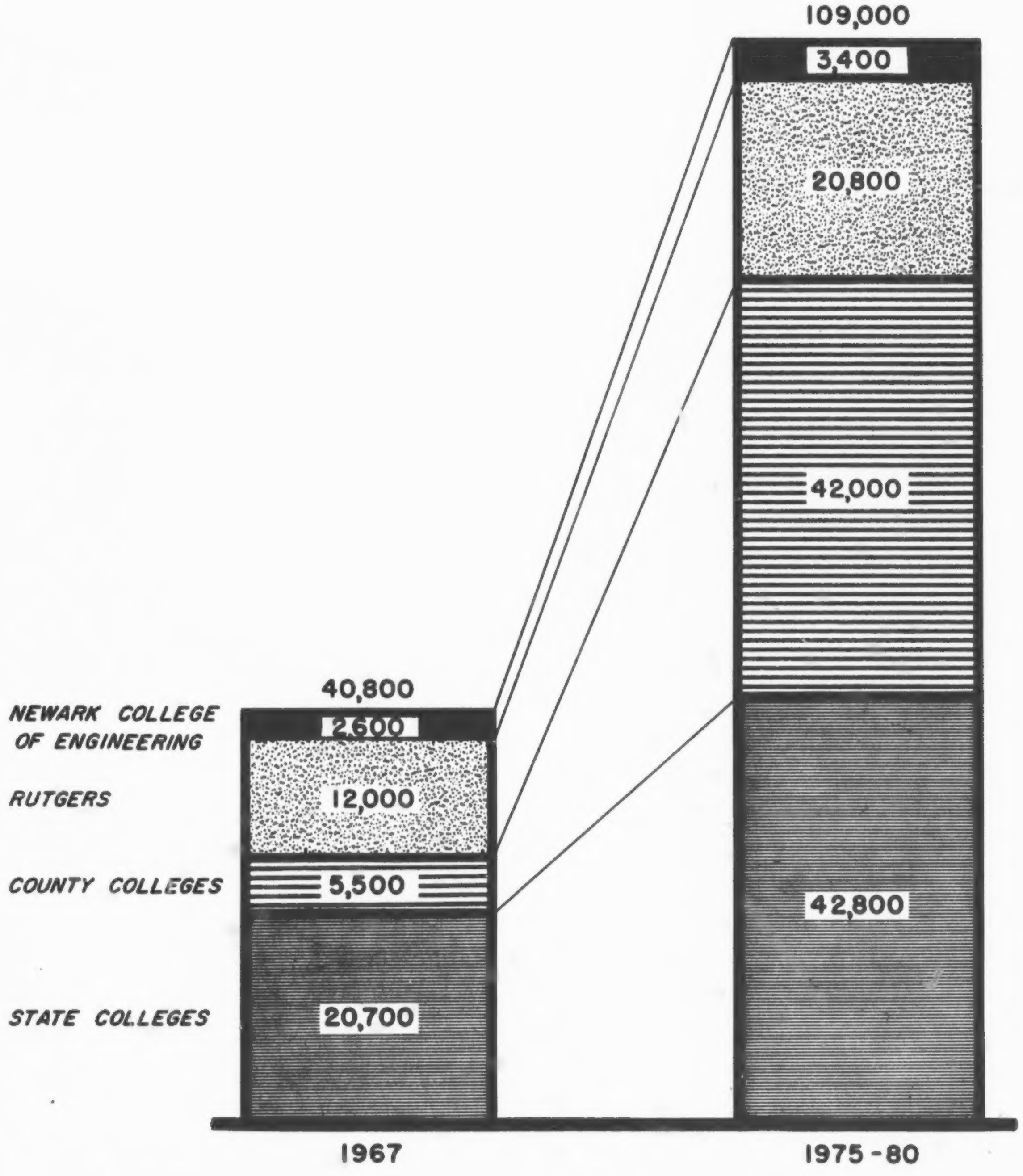


ROBERT HELLER ASSOCIATES, INC.
A Subsidiary of ENGINEERS Incorporated

Exhibit 9

See pp. 46,47

FULL-TIME UNDERGRADUATE NEW JERSEY RESIDENTS ATTENDING IN-STATE PUBLIC INSTITUTIONS ACTUAL 1967 AND RECOMMENDED 1975-80



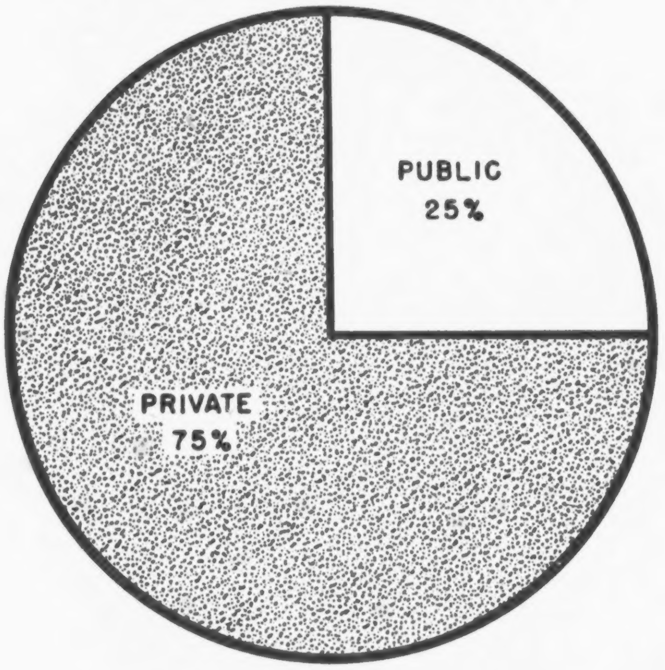
PER CENT OF UNDERGRADUATES ATTENDING PUBLIC INSTITUTIONS WITHIN OWN STATE

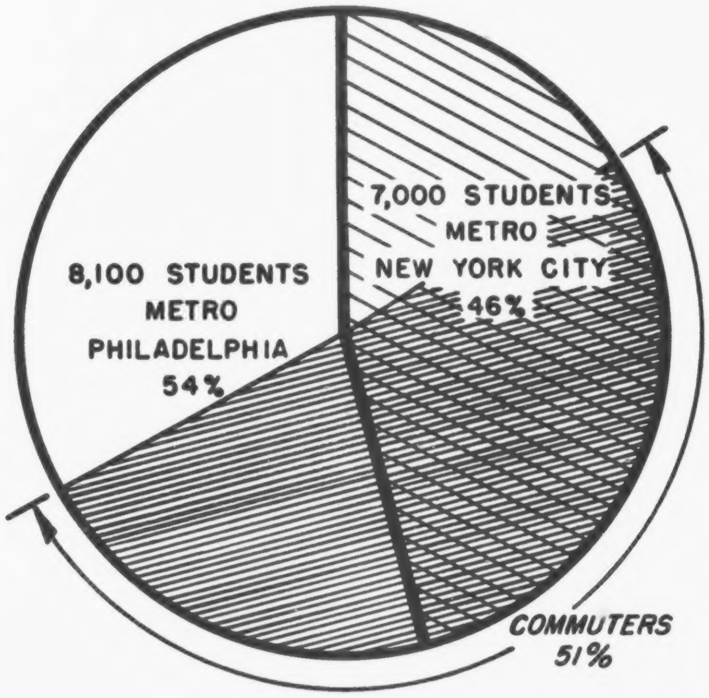
NEW JERSEY	28%	49%
UNITED STATES	57%	60+%

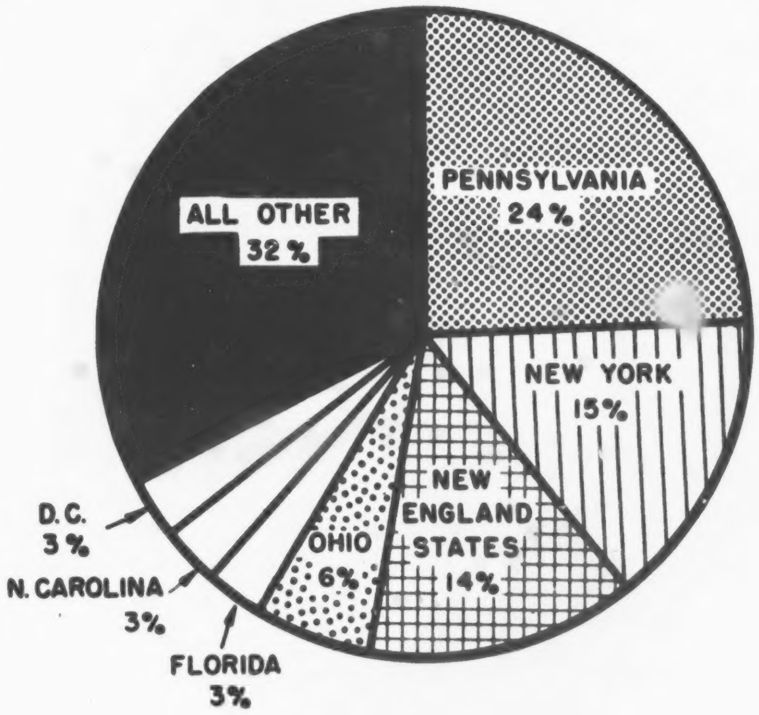
Exhibit 10

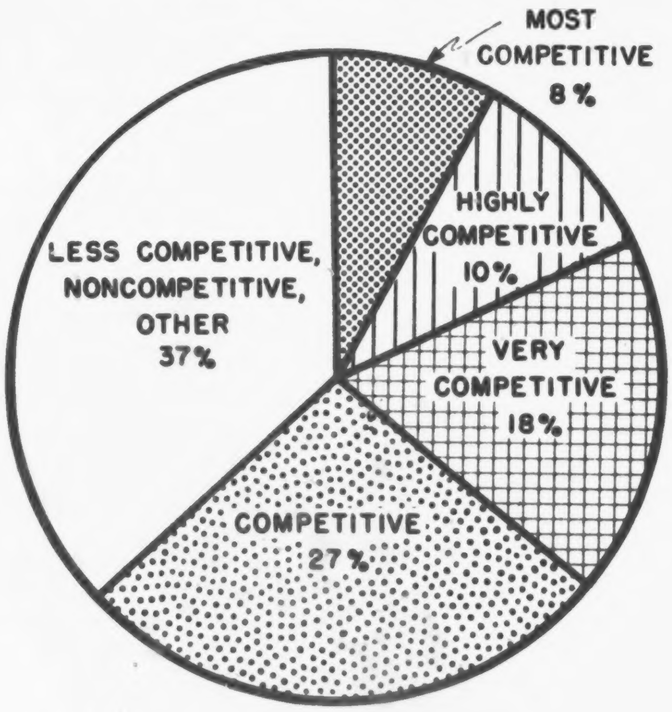
See pp. 48,49

DISTRIBUTION OF NEW JERSEY STUDENTS ATTENDING COLLEGE OUT OF STATE


BY TYPE OF CONTROL


BY TWO METROPOLITAN AREAS ONLY


BY STATE

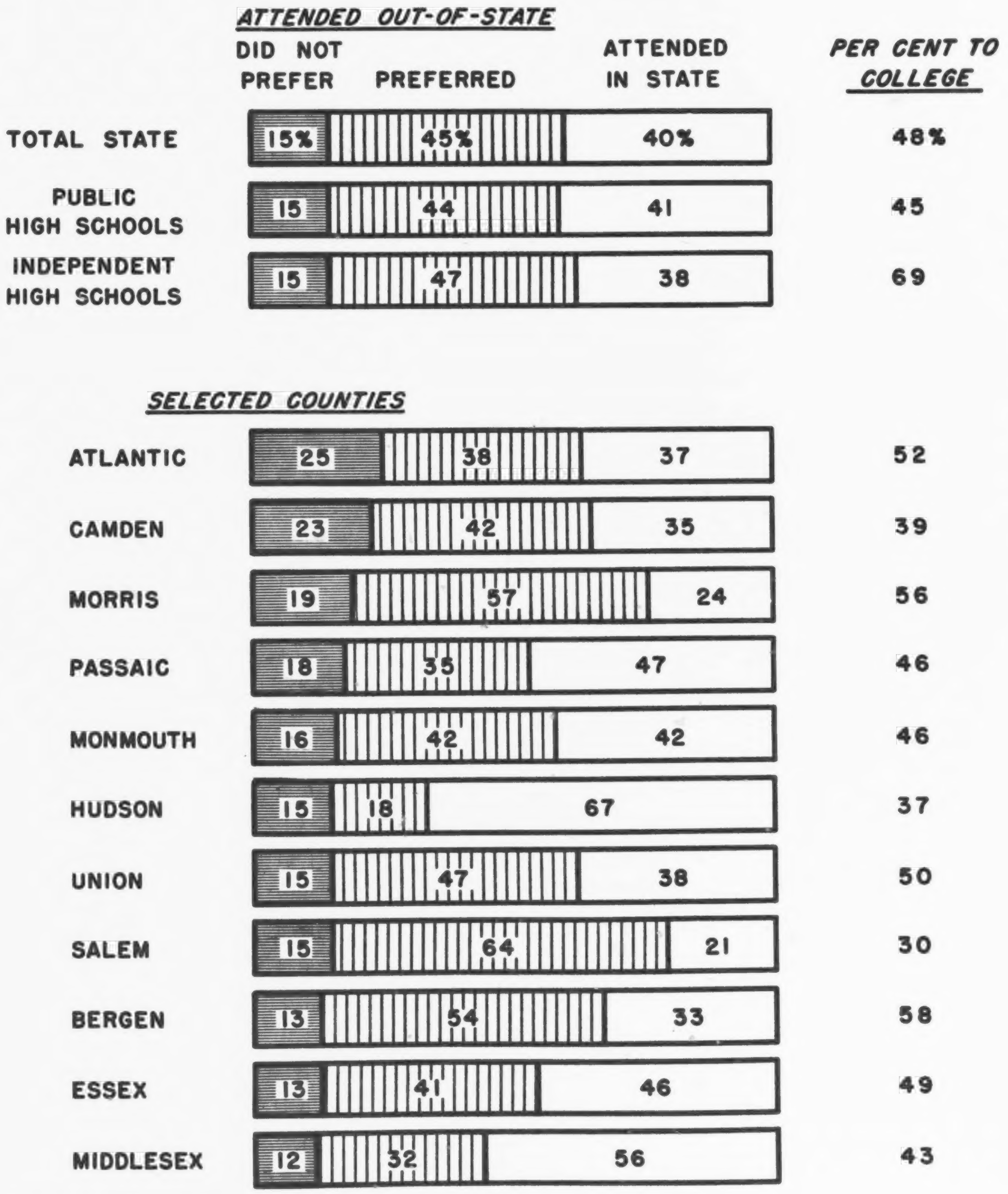

BY COMPETITIVE LEVEL

SOURCES: U.S. OFFICE OF EDUCATION, BARRON'S,
STATE DEPT. OF EDUCATION, RHA SURVEYS

Exhibit 11

See p. 51

COLLEGE PREFERENCE AND ATTENDANCE OF NEW JERSEY HIGH SCHOOL GRADUATES 1966



SOURCE: RHA SURVEY OF INDEPENDENT AND
PUBLIC HIGH SCHOOL COUNSELORS

Exhibit 12
See p. 59

GROWTH IN TOTAL ENROLLMENT AND POPULATION NEW JERSEY COMPARED WITH UNITED STATES 1950-1967

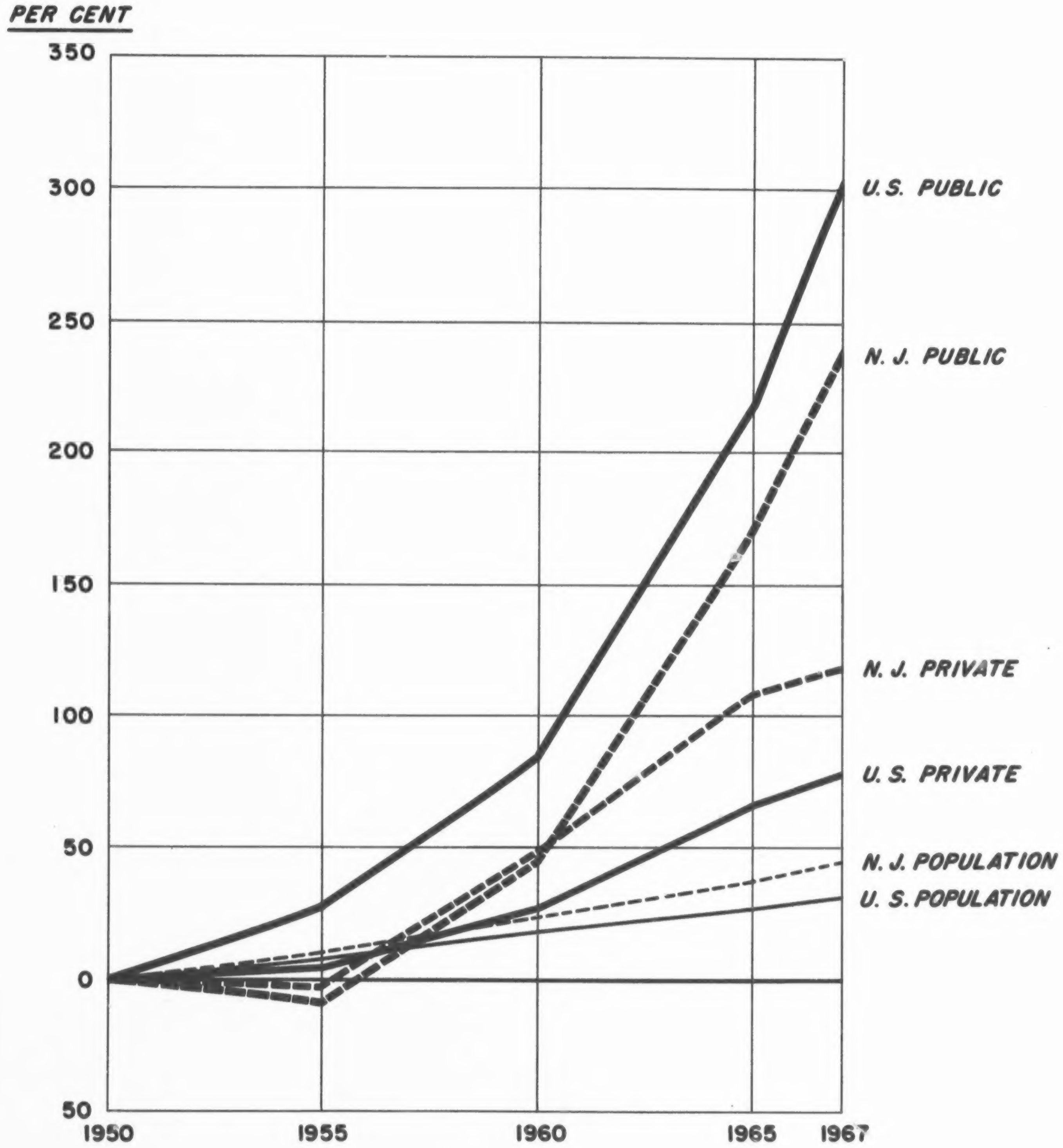


Exhibit 13
See p. 63

SOURCES OF CURRENT-FUND INCOME (EXCLUDING AUXILIARY ENTERPRISES) SELECTED TYPES OF COLLEGES AND UNIVERSITIES

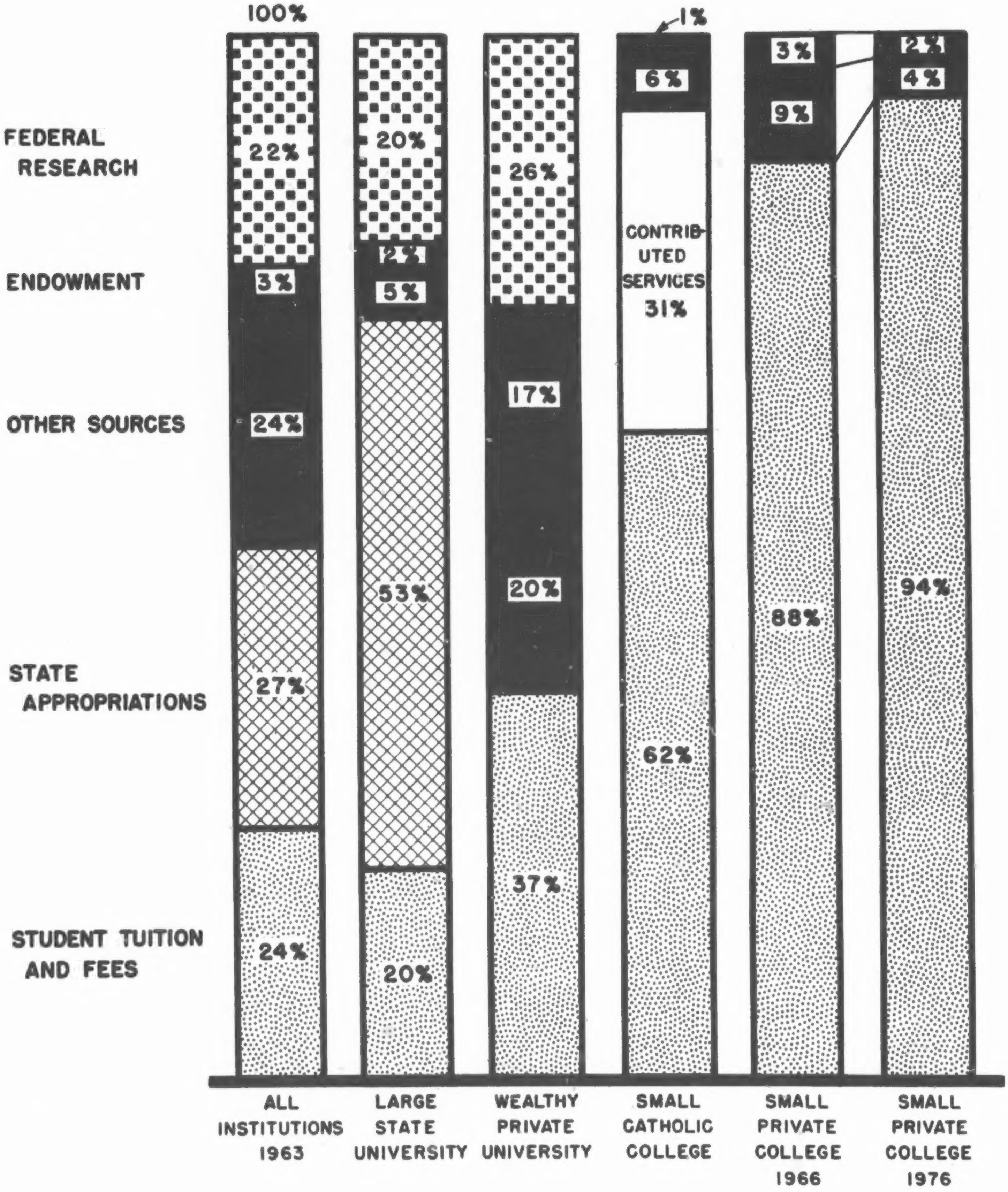
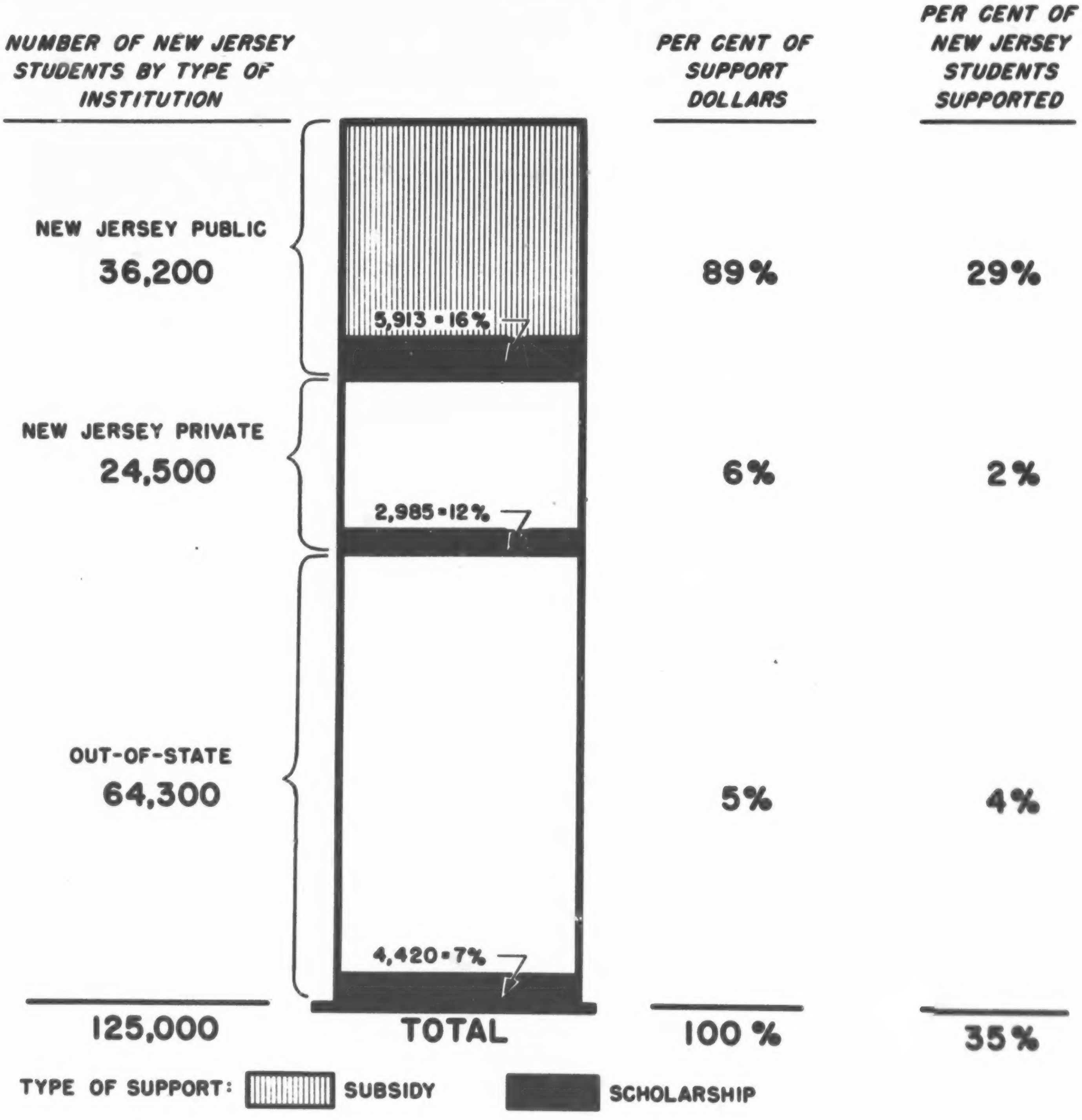


Exhibit 14
See p. 65

STATE SUPPORT OF NEW JERSEY UNDERGRADUATE STUDENTS
1966



SCHOLARSHIP AWARDS SUMMARY - 1966

INSTITUTION	*TOTAL AWARDS*	*STUDENTS*	*AVERAGE AWARD PER STUDENT*
N.J. PUBLIC	$ 1,582,200	5,913	$ 268
N.J. PRIVATE	$ 2,145,000	2,985	$ 719
OUT-OF-STATE	$ 1,927,200	4,420	$ 436
TOTAL	$ 5,654,400	13,318	$ 424

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Exhibit 15
See p. 66

ALTERNATE MODELS OF FUTURE DISTRIBUTION OF NEW JERSEY UNDERGRADUATES NEW JERSEY INSTITUTIONS AND OUT-OF-STATE

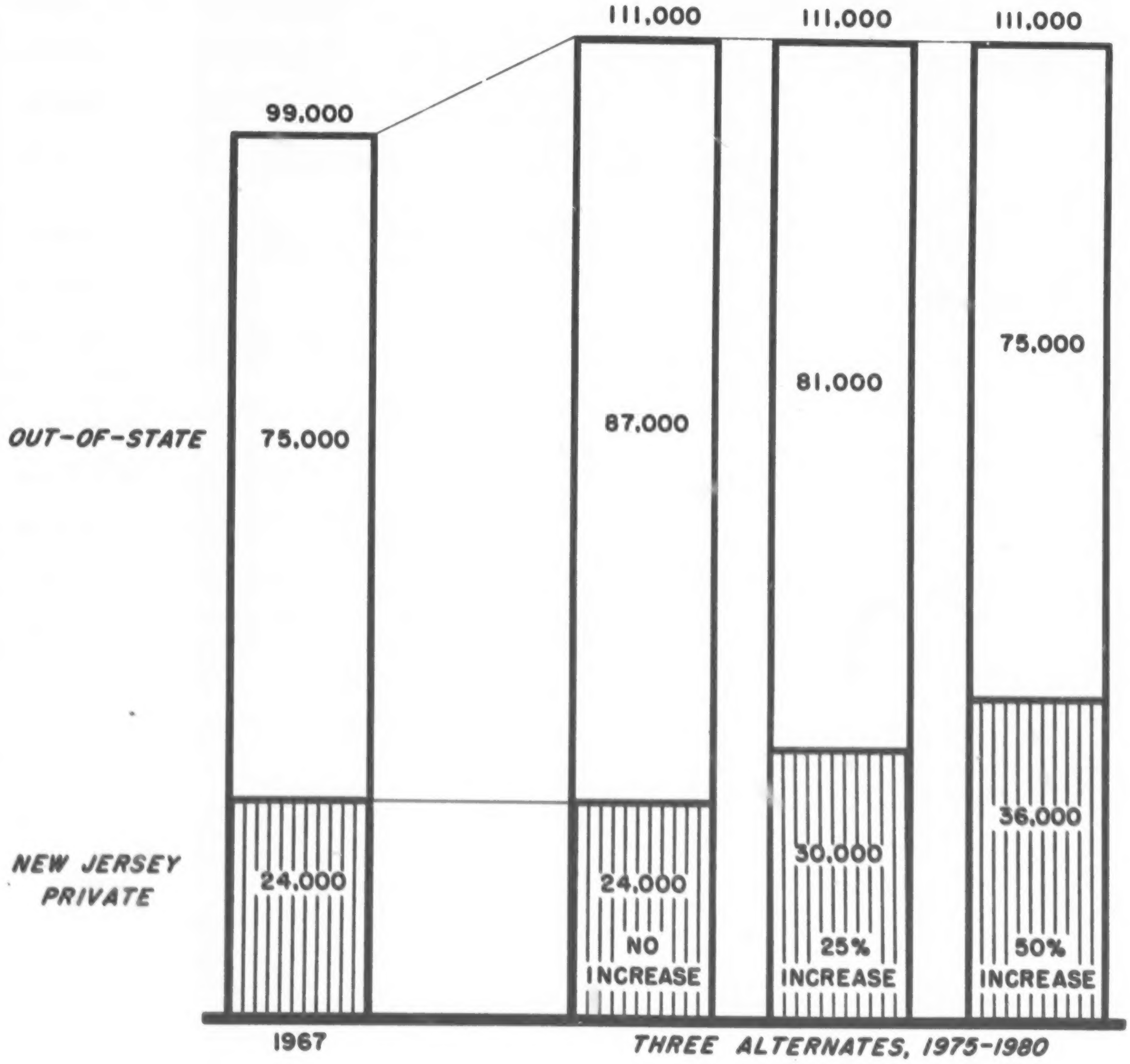

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Exhibit 16
See p. 69

DISTRIBUTION OF DEMAND BY COUNTY AND TYPE OF INSTITUTION, 1975-80 FULL-TIME UNDERGRADUATES

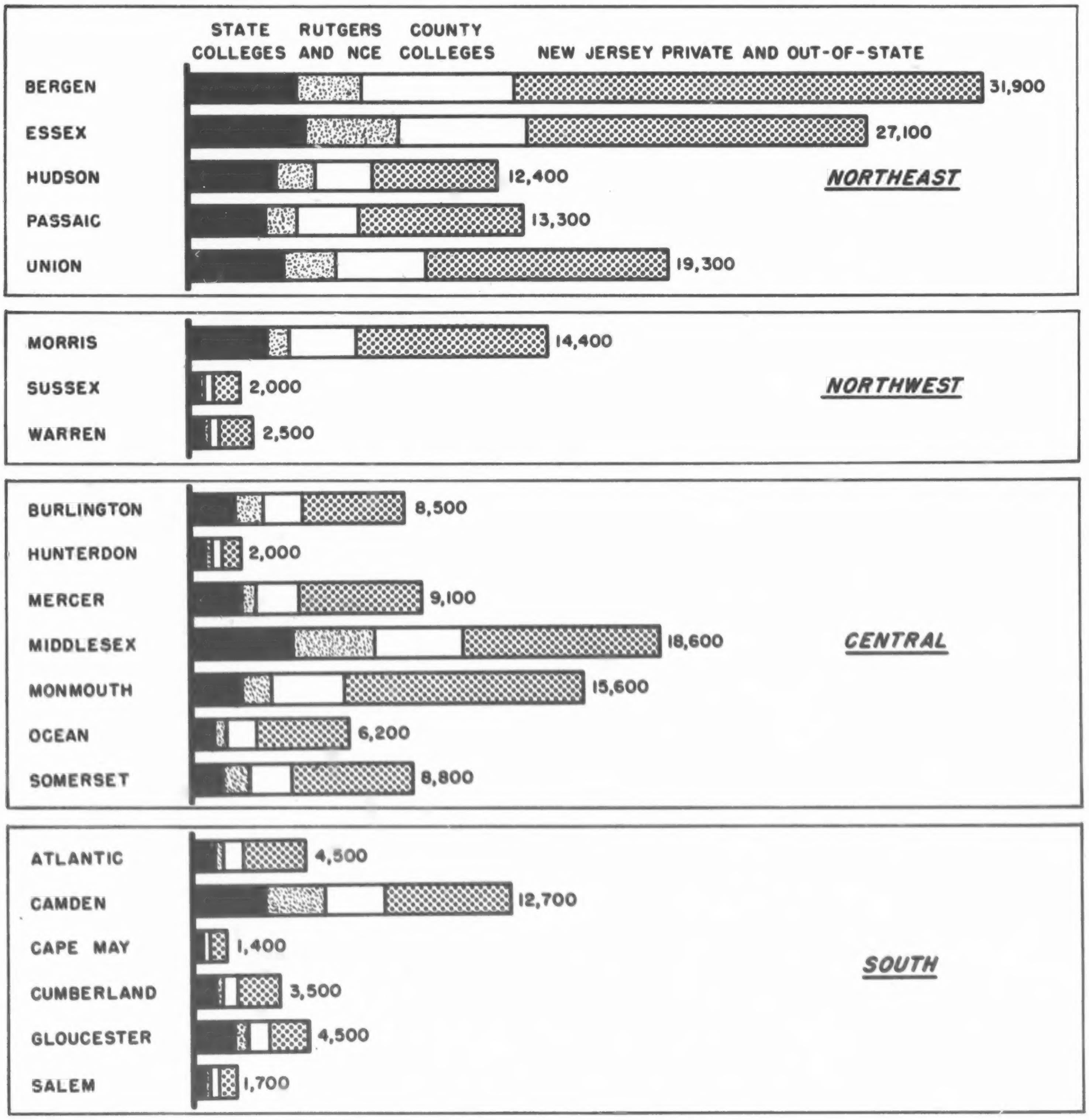
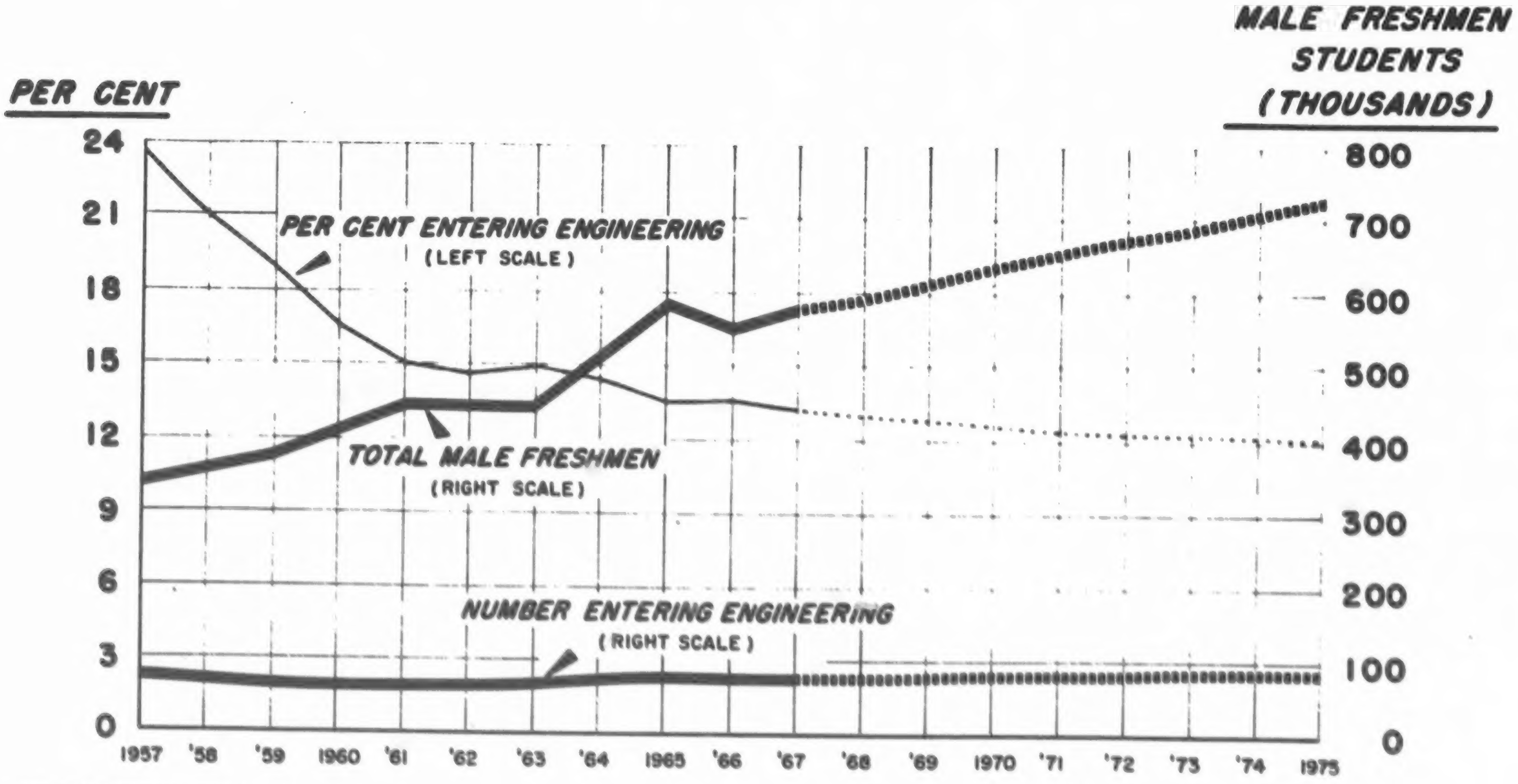


Exhibit 17

See pp. 74,75

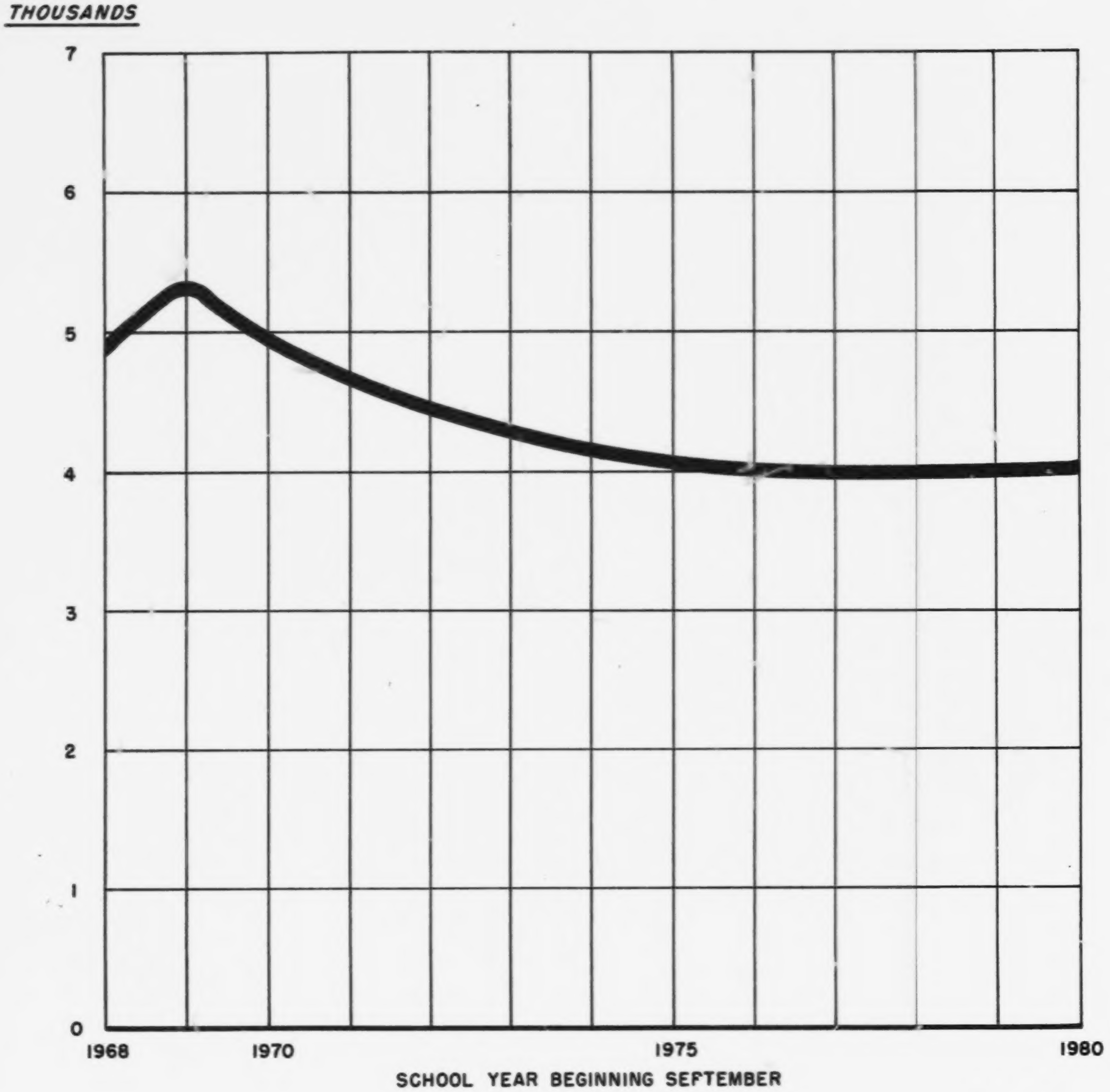
UNDERGRADUATE ENGINEERING ENROLLMENT
UNITED STATES



SOURCE: ENGINEERS JOINT COUNCIL

Exhibit 18
See pp. 81,82

FORECAST YEARLY REQUIREMENTS FOR BEGINNING TEACHERS
NEW JERSEY PUBLIC SCHOOLS
1968-1980



ESTIMATED TOTAL TEACHING STAFF

1968	1970	1972	1974	1976	1978	1980
67,600	70,700	72,500	73,700	74,400	75,200	75,700

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Exhibit 19
See p. 84

GRADUATE DEGREES IN SELECTED STATES

1965-66

State	Master's Degrees No.	Master's Degrees % Of Total	Doctor's Degrees No.	Doctor's Degrees % Of Total	Population 1965 (000)	Population 1965 % Of Total
New York	19,037	13.5	2,122	11.7	18,106	9.3
California	13,049	9.3	2,011	11.0	18,403	9.5
Michigan	8,607	6.1	919	5.0	8,317	4.3
Illinois	8,378	6.0	1,244	6.8	10,641	5.5
Massachusetts	8,208	5.8	1,161	6.4	5,361	2.8
Pennsylvania	7,467	5.3	935	5.1	11,583	6.0
Wisconsin	3,108	2.2	566	3.1	4,140	2.1
New Jersey	3,461	2.5	451	2.5	6,781	3.5
Total U.S.	140,555	100.0	18,237	100.0	193,795	100.0

Source: Earned Degrees Conferred 1965-66
Office of Education, U.S. Department of Health, Education
and Welfare

Exhibit 20

See p. 91

COMPARISON OF SEVERAL PLANNING MODULES (NET SQUARE FEET PER STUDENT)

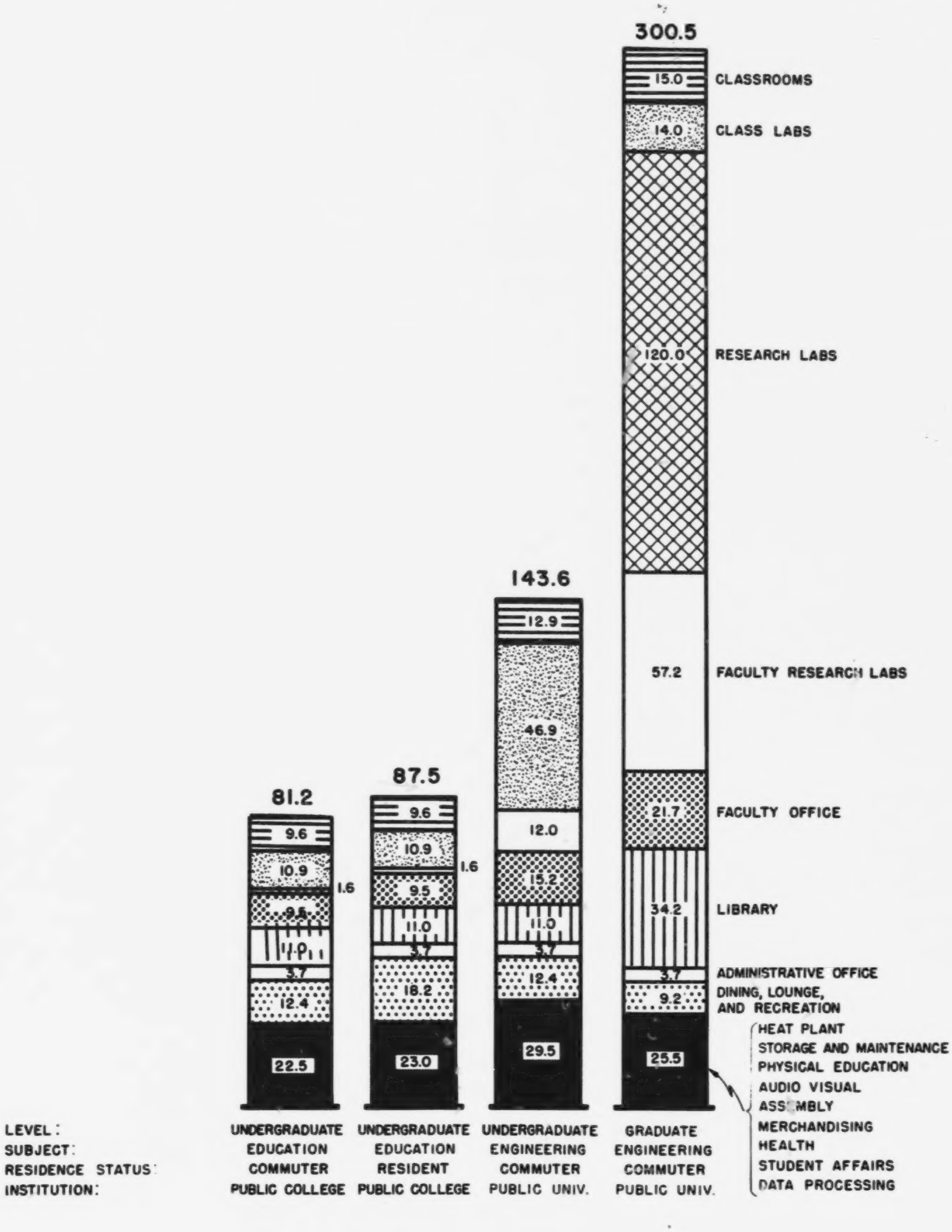

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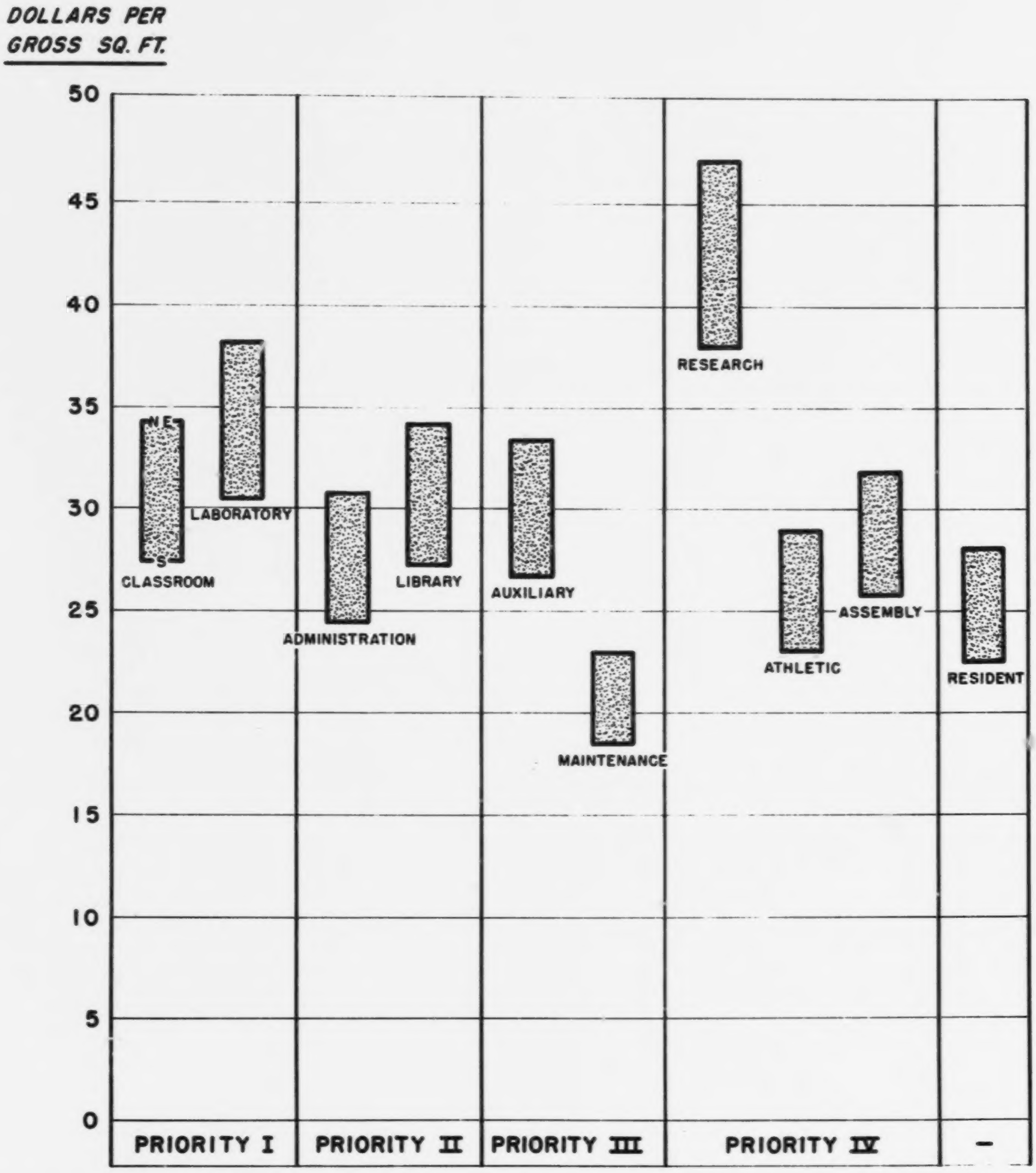
Exhibit 21
See p. 93

ESTIMATED 1968 COST PER SQUARE FOOT FOR NEW HIGHER EDUCATION CONSTRUCTION IN NEW JERSEY BY CATEGORY OF SPACE AND REGION



NOTE: TOP OF EACH BAR REPRESENTS COSTS IN NORTHEAST NEW JERSEY, BOTTOM OF EACH BAR REPRESENTS COSTS IN SOUTHERN NEW JERSEY AND ESTIMATED COSTS FOR CENTRAL AND NORTHWEST NEW JERSEY FALL BETWEEN.

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APPENDIXES

PROJECTION OF NEW JERSEY FULL-TIME ENROLLMENT DEMAND

Steps taken to project New Jersey full-time enrollment demand in future years are outlined briefly and then described in more detail:

1. Various enrollment data projected through 1975 and 1985 by the United States Office of Education and the Department of Commerce were analyzed. The projections available were for undergraduate, full-time, and part-time students but the data also included first professional enrollment which had to be identified and separated from the rest.
2. Present New Jersey population and college enrollment as a percentage of total United States population and total college enrollment were analyzed.
3. Projections were made of New Jersey full- and part-time enrollment to future years.
4. Part-time enrollment in New Jersey for the projected years was subtracted from total enrollment, leaving the full-time undergraduate New Jersey enrollment demand. It should be emphasized that this enrollment demand from New Jersey takes in all New Jersey students who will attend college, both in New Jersey and in other states.

Step 1

A major source of enrollment projection data through 1975 is a booklet, "Projections of Educational Statistics to 1975-1976", issued in 1966 by the Office of Education, United States Department of Health, Education, and Welfare. These projections are listed in the first column of Exhibit A-1. The projections are for full- and part-time undergraduate and first professional students and it was necessary to remove the latter. The first professional group consists of people who have taken three or four years of college and are seeking professional degrees in medicine, dentistry, law, and other fields. Calculations were made to determine the number of first professional students and the results are shown in the second column of Exhibit A-1. The third column shows the remaining full- and part-time undergraduates through 1975.

To obtain an estimate of enrollments for 1980 and 1985, two United States Department of Commerce projection series were combined. These series are P25, No. 338, May 31, 1966, "Projections of School and College Enrollment in the United States in 1985", and P20, No. 167, August 30, 1967, "School Enrollment, October 1966". By combining them it was possible to project a full- and part-time United States enrollment of undergraduates for 1980 and 1985.

Step 2

The analysis in Step 2 consisted of two parts. First, the number of New Jersey undergraduate students was needed for a base year from which projections could be made for the future. Second, an appropriate formula had to be determined to turn the base figure into projections for 1970, 1975, 1980, and 1985.

No actual figures covering total New Jersey enrollment were available for recent years. However, two sources could be drawn on to develop a working estimate for 1963, and this year was therefore selected as a base.

One source was a booklet, "Residence and Migration of College Students, Fall 1963, State and Regional Data", which was published by the Office of Education in 1965. According to this booklet, 135,300 of the 3,605,000 college undergraduates enrolled in United States higher education institutions in 1963 came from New Jersey. This represented 3.75% of the country's total enrollment.

The other source was the "Projections of Educational Statistics" already mentioned, which gave 3,880,000 as the United States total for 1963 undergraduates but did not include state-by-state figures. If the same figure for New Jersey is applied to this total, the percentage becomes 3.5.

Since forecasts for 1970, 1975, 1980, and 1985 will use "Projections of Educational Statistics" as a base, the percentage of 3.5 was chosen although the figure of 3.75% is still considered to be accurate when New Jersey educational participation is compared with other states.

The percentage of participation is not expected to stabilize, however. Therefore, two questions had to be answered:

1. Will New Jersey's college age population - the 18-to-21-year-olds - increase at the same rate as that of the United States as a whole? It was found that the State's college age population is forecast to

increase more rapidly than the national average - from 3.12% of the national total in 1965 to 3.43% in 1985.

2. Why does New Jersey send a relatively greater proportion of its population to college than the nation as a whole, as studies have shown, when the State's facilities have been inadequate to meet demand? Analysis of this question revealed that in general those states with well-developed undergraduate systems tend to send a greater proportion of their young people to college than the ratio of their population to that of the United States. California is an example. Of students enrolled in colleges in the entire country in 1963, California sent 13.8% although its population is only 8.8% of the national total. New Jersey is an exception with a relatively high rate even though many of its young people go outside the State, at higher cost, to be educated. Therefore, it was assumed that when more facilities are made available within the State an even greater percentage of New Jersey young people will attend college.

Taking into account the developments foreseen in answering the two questions, it is forecast that a steadily increasing proportion of the total United States enrollment will come from New Jersey. The year-by-year increases in percentage projected through 1985 are as follows:

1960	3.12%
1965	3.48
1966	3.50
1967	3.52
1970	3.7
1975	4.0
1980	4.1
1985	4.1

Step 3

The total United States full- and part-time enrollment from Exhibit A-1 was multiplied by the projected percentage of New Jersey students expected to be enrolled full- and part-time in the years through 1985. The upper part of Exhibit A-2 illustrates this calculation and provides an estimate of New Jersey full- and part-time enrollment both within and outside the State in the projected years.

Indications are that 232,000 of the State's young people will want to enroll in 1970 and 306,000 in 1975, with an increase to 349,000 in 1980.

Step 4

College facilities are constructed for full-time students. The work in New Jersey indicated that, while much educational attention is given to the part-time student, facilities had been and would continue to be developed primarily with the needs of full-time undergraduates in mind. Therefore, it was necessary to calculate the number of undergraduates who attend college full time from New Jersey.

Returning to "Residence and Migration of College Students, Fall 1963", it is indicated that 71.8% of the New Jersey students attended a college full time in that year.

While the percentage of full-time students may increase as college places become available, it is assumed that the urban areas of New Jersey will continue to attract large numbers of part-time students. Therefore the 1963 percentage of 71.8% full-time is considered to be the best figure to project at this time. The lower part of Exhibit A-2 indicates the full-time enrollment demand finally projected, rising from 167,000 in 1970 to 250,000 in 1985.

Exhibit A-1

UNITED STATES HIGHER EDUCATION ENROLLMENT PROJECTIONS
1960-1985

Year	Total Full- and Part-Time Undergraduate and First Professional	Estimated Full- and Part-Time First Professional	Estimated Full- and Part-Time Undergraduates
1960	3,227,000	121,000	3,106,000
1963	4,031,000	151,000	3,880,000
1964	4,433,000	158,000	4,275,000
1965	4,945,000	165,000	4,780,000
1966	5,408,000	173,000	5,235,000
1967	5,832,000	181,000	5,651,000
1970	6,473,000	205,000	6,268,000
1975	7,905,000	244,000	7,661,000
1980	N. A.	-	8,509,000 *
1985	N. A.	-	8,484,000 *

*** Based on RHA analysis of Department of Commerce projection series P25, No. 338, and P20, No. 167.**

Exhibit A-2

NEW JERSEY UNDERGRADUATE ENROLLMENT
1965-1985

Total Enrollment

Year	Total United States Full- and Part-Time Enrolled	Projected New Jersey % of United States Enrolled	New Jersey Full- and Part-Time Enrolled
1965	4,780,000	3.48%	167,000
1966	5,235,000	3.50	183,000
1967	5,651,000	3.52	199,000
1970	6,268,000	3.7	232,000
1975	7,661,000	4.0	306,000
1980	8,509,000	4.1	349,000
1985	8,484,000	4.1	348,000

Full-Time Enrollment

Year	New Jersey Full- and Part Time Enrollment	Estimated Full-Time New Jersey Enrollment Demand *	Actual Full-Time Enrollment
1965	167,000	120,000	120,000
1966	183,000	131,000	131,300
1967	199,000	143,000	139,700
1970	232,000	167,000	-
1975	306,000	220,000	-
1980	349,000	250,000	-
1985	348,000	250,000	-

* Full-time estimated at 71.8% of combined full- and part-time enrollment.

DEMAND FOR COLLEGE AND UNIVERSITY PLACES BY COUNTY
1975

This appendix is divided into two sections. Section 1 describes the methods used to develop the demand for undergraduate places by county in 1975. Section 2 breaks down the demand by type of college.

SECTION 1

Four major steps were taken to develop the estimate of demand for college places in 1975 in each county:

1. Calculation of total undergraduate enrollment in 1967 in each county.
2. Comparison of county's college enrollment with high school graduates of 1967.
3. Forecast of county's high school graduates in 1975.
4. Conversion of high school graduates to demand for full-time college places in 1975.

Step 1

The RHA survey of guidance counselors described in the main body of the report and data from the Office of Statistical Services of the State of New Jersey, Department of Education, furnished information that provided a basis for estimating the number and county origin of New Jersey students in college in the fall of 1967.

Step 2

The Office of Statistical Services provided the number of public high school graduates and the number who continued on to college from each county in the State in the year 1967. RHA was able to estimate from other information available the number of private high school graduates and how many continued on to college.

Step 3

The 1967 high school graduates in each county were divided by the total population of that county in the same year to determine their percentage of the total population. Total population for each county was calculated on the basis of five-year estimates provided by the New Jersey Department of Conservation and Economic Development. Population groupings of 14-to-17 or 18-to-21-year-olds would have been useful, but the Department data covered only total population of each county.

Each county's percentage of high school graduates was then multiplied by the county population projected by the Department for the year 1975. This provides a figure for each county which, however, had to be refined because it was recognized that the same educational conditions prevalent in 1967 would not exist in 1975. The Office of Statistical Services indicated that an additional 17,000 students would graduate in New Jersey in 1975, over and above the estimate of high school graduates obtained by using 1967 percentages. Of these additional high school graduates, 10,000 would result from an increase in the number of 14-to-17-year-olds as a percentage of total population and 7,000 from an increase in percentage of students completing high school.

It is assumed that the 10,000 increase will occur more or less in proportion to the number of high school graduates in each county. The 7,000 gain in students completing high school instead of dropping out was distributed among the counties in proportion to each county's projected share of the State's dropouts.

In this way the number of 1975 high school graduates in each county was projected.

Since this method dealt with absolute numbers in each county rather than percentages, it was possible to give adequate weight to both the populous county where a small percentage of dropouts represents a large number and the small county which has a large percentage but a much smaller total number of dropouts.

Step 4

To convert the number of high school graduates in each county in 1975 into demand for full-time college places the following procedures were used.

The number of high school graduates going on to college in 1975 was determined by calculating the percentage that high school graduates in 1967 represented of the total population and then applying that percentage to the forecast population in 1975. This gave for each county the number of high school graduates continuing on to college on the assumption that educational conditions would not change from 1967 to 1975.

However, it was projected that throughout the State an additional 15,500 high school graduates would enter college in 1975 as a result of the increased "aspiration level". It was necessary to distribute these 15,500 among each of the counties. This was done in a manner similar to that used to calculate for each county the reduction in high school dropouts. The 15,500 represent 25.4% of the total State-wide theoretical pool of 61,000 high school graduates that would not go to college in 1975 if 1967 conditions then prevailed. Accordingly, this percentage was multiplied by each county's theoretical pool to project the number of additional high school graduates that it would send to college as a result of the projected increased aspiration level in 1975.

It is projected that in 1975 the college attendance pattern among the counties will still be far from uniform in that certain counties will send a much higher percentage of their high school graduates on to college than others. However, it is forecast that the lower-ranking counties will reduce the gap in the percentage of high school graduates entering college.

For each county, the number of freshmen entrants to college was then converted to total four-year undergraduate enrollment by applying appropriate ratios. As noted previously, the total number for the State as a whole is 220,000.

SECTION 2

When the demand for college places in 1975 to 1980 was projected county by county, the next stage of work was to break down this demand in each county according to the type of institution that will be attended. Exhibit B-1 shows the projected number of students from each county that will be enrolled in the State colleges, Rutgers, NCE, county colleges, and the balance that will enroll in New Jersey private and out-of-state institutions. These projections were derived in the following manner.

State Colleges

For each county, the number of total students attending college in 1960 and 1966 were determined, and the percentage of these attending the six State colleges was established. Thus the recent trend in State college attendance in each county was determined. These trends were analyzed, and a projection was made for each county of the percentage of its college-going residents that would be enrolled in the State colleges in 1975.

It was assumed that two new State colleges would be established before 1975 - one in the Morris-Bergen County area and the other in Atlantic County. The effect of these new colleges on State college attendance patterns was projected by examining present variations in county attendance patterns according to the location of the existing State colleges.

The projected percentage of students attending State colleges was converted to an absolute number for each county. These numbers total 42, 800.

Rutgers and NCE

The numbers of students attending Rutgers from each county in 1966 were examined and the percentages of total college-going residents represented by those numbers were calculated and analyzed. Growth plans of Rutgers were examined and projections made of the percentage of college-going residents that each county would send to Rutgers in 1975. It was judged that these percentages would increase for the counties near the Newark and Camden campuses because of the growth plans of these campuses and the low present percentages to Rutgers, but that the percentage in Middlesex County will decrease somewhat from its current very high figure of 18%.

Similar projections were made for NCE to establish the total percentage of each county's college-going residents that will attend NCE in 1975. The percentage figures were then converted to absolute numbers to forecast the number of students from each county in the State that will attend Rutgers and NCE in the 1975 to 1980 period.

County Colleges

As noted previously in this report, it was estimated that 20% of the State's total undergraduates in the 1975 to 1980 period would be enrolled in county colleges within the State. This generally conforms to the national pattern and, more important, to the actual experience of the five county colleges that have been established for a few years. It was assumed that the pattern of 20% attendance at county colleges would approximately prevail in each county in 1975 to 1980, and this percentage was used to estimate the number of students in each county that will attend county colleges in 1975-1980.

In-State Private and Out-of-State Institutions

In the foregoing manner, the total number of students in each county that will attend in-state public institutions was projected for 1975 to 1980. This was deducted from each county's total college-going residents in that period. The balance of the students will attend private colleges in the State and out-of-state institutions. For the State as a whole, this number is projected to be 111,000, slightly more than half the State's total college-going residents at that time.

Exhibit B-1

TOTAL UNDERGRADUATE ENROLLMENT DEMAND DISTRIBUTION BY COUNTY AND TYPE OF INSTITUTION
1975-1980

County	Total Enrollment Demand	Eight State Colleges	Rutgers	NCE	County Colleges	New Jersey Private and Out-of-State
Northwest						
Morris	14,400	3,100	700	200	2,750	7,650
Sussex	2,000	400	100	20	380	1,100
Warren	2,500	500	150	20	470	1,360
Total	18,900	4,000	950	240	3,600	10,110
Northeast						
Bergen	31,900	4,300	2,000	540	6,100	18,960
Essex	27,100	4,700	3,100	750	5,150	13,400
Hudson	12,400	3,500	1,250	370	2,350	4,930
Passaic	13,300	3,000	1,000	310	2,550	6,440
Union	19,300	3,800	1,850	400	3,700	9,550
Total	104,000	19,300	9,200	2,370	19,850	53,280
Central						
Burlington	8,500	1,800	1,000	20	1,600	4,080
Hunterdon	2,000	600	200	20	400	780
Mercer	9,100	2,000	500	50	1,750	4,800
Middlesex	18,600	4,000	3,000	260	3,550	7,790
Monmouth	15,600	2,000	1,000	140	2,950	9,510
Ocean	6,200	900	400	50	1,200	3,650
Somerset	8,800	1,200	1,000	100	1,700	4,800
Total	68,800	12,500	7,100	640	13,150	35,410
South						
Atlantic	4,500	900	300	30	850	2,420
Camden	12,700	2,900	2,300	40	2,400	5,060
Cape May	1,400	250	100	20	300	730
Cumberland	3,500	900	200	20	650	1,730
Gloucester	4,500	1,600	500	20	850	1,530
Salem	1,700	450	150	20	350	730
Total	28,300	7,000	3,550	150	5,400	12,200
Grand Total	220,000	42,800	20,800	3,400	42,000	111,000

DEVELOPMENT OF SPACE PLANNING MODULE

Facilities needs for higher education should be projected in a way that isolates the space required per student so that variations in enrollment and construction costs can be readily accommodated.

A useful method is to break down space by categories (classroom, office, and so on) and determine the amount of each category required by each type of student - whether a liberal arts undergraduate, an engineering student, or other. This has been termed a "space planning module". When the module is multiplied by the number of students to be accommodated, the total amount of space required - and the amount in each category of space - can be determined. Multiplying the number of square feet in each category by a cost per square foot then gives the total capital cost.

For planning purposes RHA used the full-time day student as the basis of the module. Investigation indicated that major institutions did not plan facilities for the part-time or evening students, but utilized the space left vacant by the day students for the evening programs.

Different types of students require varying amounts of space depending on curriculum, type of institution, type of residence, academic level, undergraduate or graduate, and so on. Accordingly, individual planning modules were developed for each type of student.

Each module shows amounts of space required by category of space. This is important not only because different types of students need varying amounts of the different categories of space but also because categories of space differ in construction cost per square foot.

The space categories used by RHA closely approximate the classification system outlined by the "Higher Education Facilities Classification and Inventory Procedure Manual" published in 1968 by the Higher Education Study Branch of the United States Office of Education's National Center for Educational Statistics.

The per-student module for each category of space was derived by applying various standards. These standards indicate the amount of space required by a student when he uses a facility and the amount of time a facility should be in use. The standards used were developed after extensive research of facilities at New Jersey institutions and analysis of space standards used by other states. The following example shows how laboratory space needs were calculated for two different types of undergraduates at a public college:

Laboratory Planning Standards

	Liberal Arts	Engineer
Net Square Feet Per Student Station	50	100
Average Hours Student is in Scheduled Laboratories	2.0 Per Week	5.5 Per Week
Hours Average Laboratory is in Use	24.0 Per Week	24.0 Per Week
Percent of Stations Occupied When Laboratory is in Scheduled Use	80%	80%

Net square feet required per student can be calculated by the following formula:

$$NSF = \frac{S \times C}{H \times U} \text{ where:}$$

S = Net square feet per student station
C = Average laboratory hours per student per week
H = Hours per week average laboratory is in use
U = Percent of stations occupied when laboratory is in use

The following calculations show the determination of the total net square feet required for each of the two types of students:

Liberal Arts Student $\frac{50 \times 2.0}{24 \times 80\%} = 5.2$ NSF

Engineering Student $\frac{100 \times 5.5}{24 \times 80\%} = 28.6$ NSF

The engineering student requires more laboratory space than the liberal arts student because he spends more time in the laboratory and occupies a larger station while he is there.

The amount of space of each category in the module was developed using standards applicable to the particular space. The space modules developed for each student type are shown on Exhibit C-1.

The per-student module is a useful tool for State-wide planning but should be used with care when applied to individual institutions. Certain activities require a minimum amount of space regardless of the number of students enrolled. In some cases space need not be expanded further after enrollment reaches a certain level. Moreover, the module approach can only be used when facilities needs can be measured on a per-student basis. Certain science disciplines require complicated and expensive facilities that are related to size of equipment rather than number of students. The equipment is needed whether one student or 100 students take the course. In using modules, individual institutions must recognize and correct for these factors.

The per-student module method of planning future space requirements concerns only quantity of space - not quality of space. Both academic and supporting space should be replaced as it becomes obsolete. Decisions of this kind need to be made individually for each college.

Additional care must be exercised when using the module to plan for an expanding institution. Since buildings are added in block fashion, an expanding college will always be out of step in some categories of space. Only if a college reaches its maximum enrollment should its facilities correspond fully to the module.

The table in Exhibit C-2 illustrates the use of the modular approach in evaluating the adequacy of facilities at the six State colleges. The module for a commuter education major at a public college is compared with the net square feet of space per student available in each of the colleges. The square feet figures were developed from an inventory made of each college's facilities in late fall, 1967.

The comparison shows that most of the State colleges lacked adequate amounts of many categories of space and that half of them were short of space over-all. Moreover, since each college is expanding its enrollment, various categories of space should have exceeded the module so that enrollment growth could be accommodated. The shortage of space indicates very high space utilization and an inability to expand enrollments without even more severe overcrowding.

PLANNING MODULES SHOWING NET S
PER FULL-TIME STUDENT AT PUBLIC

	Under				
Space Category	Four-Year College			University	
	Education	Liberal Arts	Engineering	Education	Liberal Arts
Classrooms	9.6	12.3	15.0	10.8	13.0
Laboratories-Class	10.9	5.2	28.6	13.1	10.0
Research-Student	--	--	--	--	--
Research-Faculty	1.6	1.6	12.0	1.6	1.6
Data Processing	.6	.6	.6	.6	.6
Office-Administration	3.7	3.7	3.7	3.7	3.7
Faculty	9.5	9.5	15.2	9.5	9.5
Library	11.0	11.0	11.0	11.0	11.0
Physical Education	9.8	9.8	9.8	9.8	9.8
Audio-Visual	.6	.6	.6	.6	.6
Assembly	2.0	2.0	2.0	2.0	2.0
Dining Hall	3.9	3.9	3.9	3.9	3.9
Snack Bar	3.3	3.3	3.3	3.3	3.3
Lounge and Recreation	5.2	5.2	5.2	5.2	5.2
Merchandise	2.0	2.0	2.0	2.0	2.0
Health	.5	.5	.5	.5	.5
Student Affairs	1.0	1.0	1.0	1.0	1.0
Heat	1.0	1.0	1.0	1.0	1.0
Storage	5.0	5.0	5.0	12.0	12.0
Total Net Square Feet	81.2	78.2	120.4	91.6	90.7
Total Gross Square Feet	135.3	130.3	200.7	152.7	151.2

* Does not include dormitory facilities.
[ ] Indicate minus figures.

Exhibit C-1
Page 1 of 2

QUARE FEET
INSTITUTIONS

graduate

	Two-Year College			
	General	Career		
Engineering	Academic	Non-laboratory	Laboratory	Add for Resident*
12.9	11.4	11.0	10.3	--
46.9	6.5	13.0	47.9	--
--	--	--	--	--
12.0	--	--	--	--
.6	.6	.6	.6	--
3.7	3.7	3.7	3.7	--
15.2	9.5	9.5	9.5	--
11.0	8.7	7.0	7.0	--
9.8	10.9	10.9	10.9	--
.6	.6	.6	.6	--
2.0	2.0	2.0	2.0	--
3.9	3.9	3.9	3.9	11.7
3.3	3.3	3.3	3.3	[3.3]
5.2	5.2	5.2	5.2	[2.6]
2.0	2.0	2.0	2.0	--
.5	.5	.5	.5	.5
1.0	1.0	1.0	1.0	--
1.0	1.0	1.0	1.0	--
12.0	5.0	5.0	5.0	--
143.6	75.8	80.2	114.4	6.3
239.3	126.3	133.7	190.7	10.7

PLANNING MODULES SHOWING NET SQUARE
PER FULL-TIME STUDENT AT PUBLIC INSTIT

Space Category	Education	Liberal Arts	Science
Classrooms	14.0	14.0	9.7
Laboratories-Class	--	--	26.0
Research-Student	9.0	9.0	50.4
Research-Faculty	28.6	28.6	28.6
Data Processing	1.0	1.0	1.0
Office-Administration	3.7	3.7	3.7
Faculty	21.7	21.7	21.7
Library	34.2	34.2	34.2
Physical Education	6.0	6.0	6.0
Audio-Visual	--	--	--
Assembly	2.0	2.0	2.0
Dining Hall	3.9	3.9	3.9
Snack Bar	3.3	3.3	3.3
Lounge and Recreation	2.0	2.0	2.0
Merchandise	2.0	2.0	1.0
Health	.5	.5	.5
Student Affairs	1.0	1.0	1.0
Heat	1.0	1.0	1.0
Storage	12.0	12.0	12.0
Total Net Square Feet	145.9	145.9	208.0
Total Gross Square Feet	243.2	243.2	346.7

* Does not include dormitory facilities.
[ ] Indicate minus figures.

Exhibit C-1
Page 2 of 2

FEET
TUTIONS

raduate			
Agriculture	Law	Engineering	Add for Resident*
8.3	25.0	15.0	--
63.0	--	14.0	--
60.0	--	120.0	--
85.7	20.0	57.2	--
1.0	1.0	1.0	--
3.7	3.7	3.7	--
21.7	15.2	21.7	--
34.2	34.2	34.2	--
6.0	6.0	6.0	--
--	--	--	--
2.0	2.0	2.0	--
3.9	3.9	3.9	11.7
3.3	3.3	3.3	[3.3]
2.0	2.0	2.0	--
1.0	2.0	2.0	--
.5	.5	.5	.5
1.0	1.0	1.0	--
1.0	1.0	1.0	--
12.0	12.0	12.0	--
310.3	132.8	300.5	8.9
517.2	221.3	500.8	15.1

COMPARISON OF PER STUDENT PLANNING MODULE WITH EXISTING NET SQUARE FEET AVAILABLE PER STUDENT AT EACH STATE COLLEGE - FALL, 1967

	Education Commuter Public College	Glassboro	Jersey City	Montclair
Classrooms	9.6	9.8	7.4	10.1
Laboratories - Class	10.9	15.4	6.9	13.9
Laboratories - Individual	-	.3	.5	.3
- Research	1.6	.1	.1	-
Data Processing	.6	-	-	-
Office - Administration	3.7	4.0	2.9	2.7
- Faculty	9.5	8.7	6.6	7.9
Library	11.0	7.6	4.2	9.7
Physical Education	9.8	12.7	5.4	11.3
Audio Visual	.6	.2	.4	1.3
Assembly	2.0	1.0	3.4	5.6
Dining Hall	3.9	7.1	8.1	5.4
Snack Bar	3.3	1.1	1.7	.7
Lounge and Recreation	5.2	2.3	2.2	1.9
Merchandise	2.0	.9	.6	.5
Health	.5	-	.2	.6
Student Affairs	1.0	-	-	-
Heat	1.0	1.1	1.1	.9
Storage	5.0	3.3	.5	1.7
Net Assigned	81.2	75.6	52.2	74.5
Other (Primarily Demonstration School)	-	8.5	2.1	1.5
Total Net Square Feet	81.2	84.1	54.3	76.0
Full-Time Enrollment		3,530	2,878	4,314

Exhibit C-2

E
UDENT

tclair	Newark	Paterson	Trenton
0.1	11.3	12.7	8.0
3.9	11.5	9.0	15.0
.3	.5	.9	.3
-	.1	.1	-
-	-	-	-
2.7	4.7	2.9	4.1
7.9	8.7	7.9	6.5
9.7	5.0	14.2	4.5
1.3	10.7	9.2	11.0
1.3	.2	1.0	1.1
5.6	4.5	6.3	3.7
5.4	3.2	7.8	7.3
.7	.8	1.5	1.2
1.9	1.9	2.2	2.3
.5	-	.6	1.0
.6	.2	.2	.6
-	-	-	-
.9	5.5	2.0	2.8
1.7	4.0	2.1	4.4
.5	72.8	80.6	73.8
.5	11.3	8.3	.3
.0	84.1	88.9	74.1
14	3,186	3,059	3,788

FACILITIES COST

Along with determining the requirements for new facilities in terms of gross square feet, a means was developed to convert the figures into dollars per square foot and total cost. Two key factors were considered:

1. Average construction costs per square foot are different for various types of space, such as classrooms, laboratories, libraries, and so on.
2. Construction costs vary widely from one area to another within New Jersey.

In order to give weight to both factors, national construction costs were analyzed and compared with costs of actual buildings constructed recently in New Jersey. The steps taken in the analysis were as follows:

1. Information obtained from the "College and University Facilities Survey, 1961-1965", a United States Office of Education study published in 1964, provides construction cost data for the entire United States broken down by building categories. The data take into account site improvement, utility connections, fixed equipment, contingencies, fees, legal and administrative expense, interest during construction, and land if a purchase was necessary. This breakdown appears as a cost per square foot in Column 1 of Exhibit D-1.
2. Costs in the Middle Atlantic states as a group were separated and analyzed in "College and University Facilities Survey, 1961-1965", but the analysis was limited to broad categories of educational construction. Column 2 of the exhibit shows estimated construction

costs for the Middle Atlantic states based on the relationship, for each category, of Middle Atlantic broad area costs to those in the United States as a whole.

3. The next step was to adjust the building cost estimates so that they would reflect the higher cost of construction in New Jersey relative to other Middle Atlantic states and also take into account the inflation that has occurred in the last few years. Construction specifications and cost for three dormitories to be bid in 1968 were available. Although these dormitories were to be built in various locations in New Jersey, a cost per building was calculated that adjusted for the cost differences in geographical areas. Using the three residence halls as a base, other categories of space were estimated. Column 3 of the exhibit indicates the cost in 1968 of building within the various categories listed.
4. At this point various buildings which had been built recently or were proposed to be built in 1967 or 1968 were compared with the square-foot cost estimates shown in Column 3. The comparison was made after regional construction cost variables were accounted for, as will be explained. It was found that the cost of buildings recently built or planned was very close to the Column 3 estimates.
5. In addition to actual construction cost, capital cost allocations should include movable as well as fixed equipment. Total capital costs shown in Column 4 of the exhibit, therefore, includes an

additional amount, between 7-1/2% to 15% depending on the category, for movable equipment in each building. This estimate was based on data from other states as well as the cost of movable equipment for buildings erected in New Jersey.

6. In order to take into account the difference in construction cost by location in New Jersey, the costs of New Jersey elementary schools were analyzed for the years 1964 and 1965. Elementary schools were used as a base because the large number constructed each year provided a more accurate area comparison than the few higher education facilities built in the last few years.

   This area analysis indicated the average cost of an elementary school building in the northeast part of the State was approximately $20 per gross square foot. Cost in the northwest area was approximately $19, in central $18, and in the southern area of New Jersey $16 per gross square foot. Therefore, it costs about 20% less to build an educational building in a southern New Jersey county than in a northeastern county.

Exhibit D-1

COST OF COLLEGE FACILITIES

PER GROSS SQUARE FOOT

	Estimated United States Average Construction Costs 1961-1965	Estimated Costs In Middle Atlantic States 1961-1965	Estimated New Jersey Costs 1968	Estimated Total Capital Cost In New Jersey 1968
Instruction	23.60	26.50	--	--
Classroom Buildings	23.10	25.94	34.25	37.50
Laboratory Buildings	25.70	28.86	38.10	44.00
Libraries	23.00	25.83	34.10	37.50
Gymnasiums	19.50	21.90	28.91	31.00
Research	33.00	35.90	47.39	54.50
General	19.80	20.30	--	--
Administration	22.70	23.27	30.72	34.00
Auditoriums	23.60	24.20	31.95	34.50
Maintenance	10.20	10.46	21.00	26.50
Residence Halls	18.50	21.30	28.12	31.00
Student Union and Dining Facilities	21.50	23.00	33.36	36.50

CAPITAL NEEDS OF PUBLIC INSTITUTIONS

In order to calculate the total cost of needed new and replacement facilities, individual analyses were made for the State colleges, county colleges, NCE, and Rutgers. Enrollment in the 1975-1980 period was projected for each. Existing facilities were examined and the extent of their utilization was analyzed to determine each institution's present enrollment capacity and its ability to handle future increases. Facilities which should be replaced before 1975 were identified.

From the foregoing data the additional facilities required to accommodate the 1975-1980 enrollment were determined. It should be noted that this method was utilized in order to determine total capital requirements rather than to create a master plan for each individual institution. The method is illustrated in the following example showing calculations for Glassboro State College.

The projected enrollment of New Jersey residents at Glassboro in the 1975-1980 period is:

	Resident	Commuter	Total
Undergraduate			
Liberal Arts	776	1,194	1,970
Education	1,394	2,136	3,530
Graduate	316	484	800
Total	2,486	3,814	6,300

For each student type, a space planning module was developed to state the square footage requirements per student. This technique is explained in Appendix C. Each category of space in each module was multiplied by the projected number of students to determine the total college space requirement in the 1975-1980 period. This is shown on Exhibit E-1 of this appendix.

Total space required at Glassboro was calculated to be 574,000 net square feet. Next, the net square footage available for use at Glassboro in 1967 was analyzed. To this square footage figure was added the new library addition which will become available in 1968. Subtracted from the figure was space in inadequate structures presently used for offices, storage, and maintenance that must be replaced. The net square footage of space available for future use was determined to be 273,500 square feet. The breakdown of this space by category is shown in the second column of Exhibit E-1.

Analysis of the first two columns and column 3, which is the difference between 1975 requirements and the present 1967 space, indicates the additional space required to handle the projected enrollment. In the remaining columns, net square feet are converted to gross square feet in each category of space, and gross square feet converted into dollars of construction cost. The calculated cost of $18,480,000 was multiplied by 80% because construction costs in southern New Jersey average 20% lower than in the north, the base established for construction costs.

An additional $1,230,000 was added as the cost of accommodating 300 out-of-state undergraduates. The total amount of $16,014,000 had to be adjusted to provide for modernizing present facilities. Based on United States Office of Education figures, an additional 3.1% was added, bringing the total cost to $16,510,000.

This is an estimate, made for State-wide planning purposes, of the capital needs of Glassboro State College. It is recognized that a master facilities plan developed for Glassboro alone could call for variations in the allotment of capital expenditures among specific facilities.

Exhibit E-2 of this appendix summarizes enrollment projections and construction costs for each institution, and also includes estimates of the cost of land and land improvements to be made by the institutions themselves and the Department of Higher Education.

To estimate facility and capital needs of the county colleges, a simpler procedure was used since all of the existing county colleges are either in new facilities or in old facilities that will be abandoned. Thus it was not necessary to evaluate the condition of existing facilities, as was done at the State colleges, Rutgers, and NCE. Rather, the total space needs of the county colleges in 1975 were calculated, based on the projected enrollment in that period, and the total cost of providing these facilities determined. From this total will be deducted the $120.6 million that has already been appropriated or spent to build the existing new county college facilities. Allowance for this deduction was made in the summary of capital requirements.

EXAMPLE OF CAMPUS WORK SHEET - SPACE REQUIREMENTS AND COST - 1
GLASSBORO STATE COLLEGE

Space Category	Total Space Net Square Feet Required 1975	Total Space Net Square Feet Fall 1967	1975 Additional Net Space Required Net Sq. Ft.	Factor	1975 Additional Space Required Gross Sq. Ft
Classrooms	69,318	40,068	29,250	1.7	49,725
Laboratories-Class	48,721	53,067	--	1.7	--
Laboratories-Individual	--	1,034	--	--	--
Research	38,879	396	38,483	1.7	65,421
Data Processing	4,101	--	4,101	1.7	6,972
Office-Administration	23,310	14,163	9,147	1.7	15,550
Facilities	69,610	28,769	40,841	1.7	69,430
Library	87,860	35,547	52,313	1.4	73,238
Physical Education	58,700	44,824	13,876	1.4	19,426
Audio-Visual	3,301	2,251	1,050	1.7	1,785
Assembly	12,600	3,500	9,100	1.4	12,740
Dining Hall	53,657	25,049	28,608	1.7	48,634
Snack Bar	12,586	3,948	8,638	1.7	14,685
Lounge and Recreation	24,558	8,815	15,743	1.7	26,763
Merchandise	12,600	3,105	9,495	1.7	16,142
Health	4,393	--	4,393	1.7	7,468
Student Affairs	6,300	--	6,300	1.7	10,710
Heat	6,300	4,055	2,245	1.4	3,143
Storage	37,100	4,910	32,190	1.4	45,066
Total Net Square Feet	573,894	273,501	305,773		
Total Gross Square Feet					486,898
Area Cost Adjustment x .8					
Cost for 300 Out-of-State Students					
Renovation Factor - 3.1%					
Total Cost					

Exhibit E-1

COST - 1975-1980

1975 ditional Space equired oss Sq. Ft.	Cost Per Gross Sq. Ft.	Total Cost ($000)
49,725	$37.50	$ 1,865
--	44.00	
--	--	--
65,421	54.50	3,565
6,972	52.00	363
15,550	34.00	529
69,430	34.00	2,361
73,238	37.50	2,746
19,426	31.00	602
1,785	37.50	67
12,740	34.50	440
48,634	36.50	1,775
14,685	36.50	536
26,763	36.50	977
16,142	38.50	621
7,468	38.50	288
10,710	36.50	391
3,143	51.00	160
45,066	26.50	1,194
486,898		18,480
		14,784
		1,230
		496
		$16,510

ESTIMATED CAPITAL COST OF HIGHER EDUCATION FACILITIES
1975-1980
(Costs in Thousands)

Institution	1975 Enrollment Graduate	1975 Enrollment Undergraduate	Estimated Total Project Construction Cost	Esti Land P and Impr
County Colleges				
Northeast	-	19,850	$ 57,565	$ 2,
Northwest	-	3,600	9,900	
Central	-	13,150	34,190	2,
South	-	5,400	12,420	2,
Sub-Total	-	42,000		
State Colleges				
Glassboro	800	5,800	16,510	
Jersey City	300	4,200	12,625	
Montclair	1,000	7,000	26,353	
Newark	500	5,600	15,937	
Paterson	300	4,300	10,425	
Trenton	800	7,600	27,135	
New College - North	450	6,000	30,959	3,
New College - South	300	4,200	18,751	2,
Sub-Total	4,450	44,700		
Rutgers				
New Brunswick	4,680	6,430	49,928	
Douglass	-	3,420	4,978	
Newark	1,270	5,350	19,128	
Camden	450	2,450	7,202	
Kilmer	-	5,350	26,549	
Sub-Total	6,400	23,000		
N. C. E.	150	3,600	7,727	1,
Total	11,000	113,300	$388,282	$18,

Exhibit E-2

LITIES

Estimated Land Purchase and Improvements	Estimated Capital Cost
$ 2,000	$ 59,565
500	10,400
2,000	36,190
2,000	14,420
	$120,575
700	17,210
495	13,120
733	27,086
600	16,537
850	11,275
-	27,135
3,600	34,559
2,350	21,101
	$168,023
-	49,928
-	4,978
600	19,728
350	7,552
-	26,549
	$108,735
1,379	9,106
$18,157	$406,439

STUDIES OF POTENTIAL STUDENTS REJECTED BY RUTGERS AND THE SIX STATE COLLEGES

The students who may be said to be "forced out" of the State include applicants rejected by New Jersey public institutions who enter out-of-state institutions.

Two studies have been made of these rejected students, and each is summarized in this appendix. The first concerned those rejected by the six State colleges, the second those refused admission to Rutgers · The State University.

State College Rejects - 1966

Tabulations kept by the State Department of Education show that in 1966 the six State colleges received a total of about 22, 400 applications. Because it is common to apply to more than one college, the number of applications is always considerably above the number of actual candidates. The 22, 400 applications came from about 11, 400 persons, most of whom also submitted applications to other colleges.

The State Department of Education furnished data on students who entered the six colleges. The Department also made available questionnaires returned by potential students who were accepted but did not enter any of the six colleges, and questionnaires from students who were rejected. RHA studied a sampling of these returns. Results of this study, which are shown on Exhibit F-1 of this appendix, indicate that 43% of the potential students were accepted and did register at one of the six State colleges.

A slightly higher number, 44%, were rejected. The remaining 13% (1, 565) were accepted by at least one State college but did not attend any of the six. These were talented students who had a wide choice of colleges. Almost equal numbers of them enrolled in the State and in out-of-state institutions, with Rutgers taking 24%, county colleges 2%, and private colleges within the State 22%. Among those going outside the State, about equal numbers went to private (24%) and to public (22%) schools. Some 6% of the accepted students did not go to college at all, at least not in the fall following their high school graduation.

A much larger group of 5, 215 applicants (44%) were rejected by all of the six State colleges to which they applied. Of this group, a slightly larger percentage went outside the State than was true of the more talented students. Furthermore, because of the size of the group, the actual number who went out of the State was considerably larger. Of this group of some 1, 720 students, 10% attended out-of-state public colleges and 23% attended out-of-state private institutions. Of the students that stayed in the State, the largest number - 1, 040 - attended private colleges. An additional 260 (5%) went to county colleges and 100 (2%) enrolled at Rutgers.

Among those not gaining admittance to the State colleges, 40%, or 2,086, reported that they did not attend college at all. Within this group undoubtedly are some students who, because of the inadequate capacity of low-cost educational institutions, are not being provided with the opportunity for a college experience. Necessarily this group also includes students whose qualifications would make it difficult for them to get into a great many other four-year colleges. It is to the first of these groups and, to a limited extent, the second group that the new county colleges will be particularly attractive.

In the 40% who did not go to college there were also some who decided not to attend college full time but rather as part-time students. No doubt there also were some who postponed their decision to go to college.

Rutgers Rejects - 1965

Rutgers rejected some 8,500 applicants for entry into the class beginning in the fall of 1965. Of these, 4,500 were rejected because they were not considered qualified. However, another 4,000 were considered qualified but were not accepted because of space limitations. A study of this group was made jointly by Rutgers and the Educational Testing Service. From answers to questionnaires obtained from 81%, a number of conclusions can be drawn.

The following table shows the disposition of the "qualified rejects":

Attending college full time	90.7%
Attending college part time	3.8%
Not planning on college in current year	4.7%
Undecided or no answer	.9%
	100.0%

For the last two groups, those whose college plans were delayed or undecided, the following data were obtained:

Plan to attend full time in the future	2.5%
Plan to attend part time in the future	1.1%
Do not plan to attend	.4%
Do not know	1.0%
No response	.6%
	5.6%

The study indicates that only a small number of students decided not to attend college at all after being rejected by Rutgers. About a dozen students who answered the questionnaire said they had no college plans and of the full 4,000 the number might be between 15 and 20 students. A larger number had their plans delayed and presumably some of those who said they intend to enroll in the future may not do so.

Therefore it cannot be said that rejection by Rutgers eliminates the college plans of a large number of students. But it is significant to see where the students rejected by Rutgers actually went. Below is a tabulation by type of institution for the 3,600 students who would have been accepted at Rutgers if space had been available:

In-State Public Colleges	15%
In-State Private Colleges	31%
Out-of-State Public Colleges	12%
Out-of-State Private Colleges	42%
	100%

Consideration of the usual Rutgers ratio of accepted students to actual enrollment suggests that at least half of these would have enrolled in Rutgers had they been accepted. While 15% of this group found a state public college as an alternative, the other 85% were forced to go to higher-cost schools. Added cost is the principal penalty for a qualified student who is rejected because of lack of space. This is illustrated by the following distribution of tuitions (including fees) in all institutions which respondents attended full time. These figures should be compared with the tuition at Rutgers which, at the time, ranged from $437 to $506.

	Students Responding	Mean Tuition and Fees
New Jersey Public	438	$ 324
New Jersey Private	827	1,024
Out-of-State Public	336	659
Out-of-State Private	1,039	1,227
Total	2,640	

None of these figures include the cost of board and room.

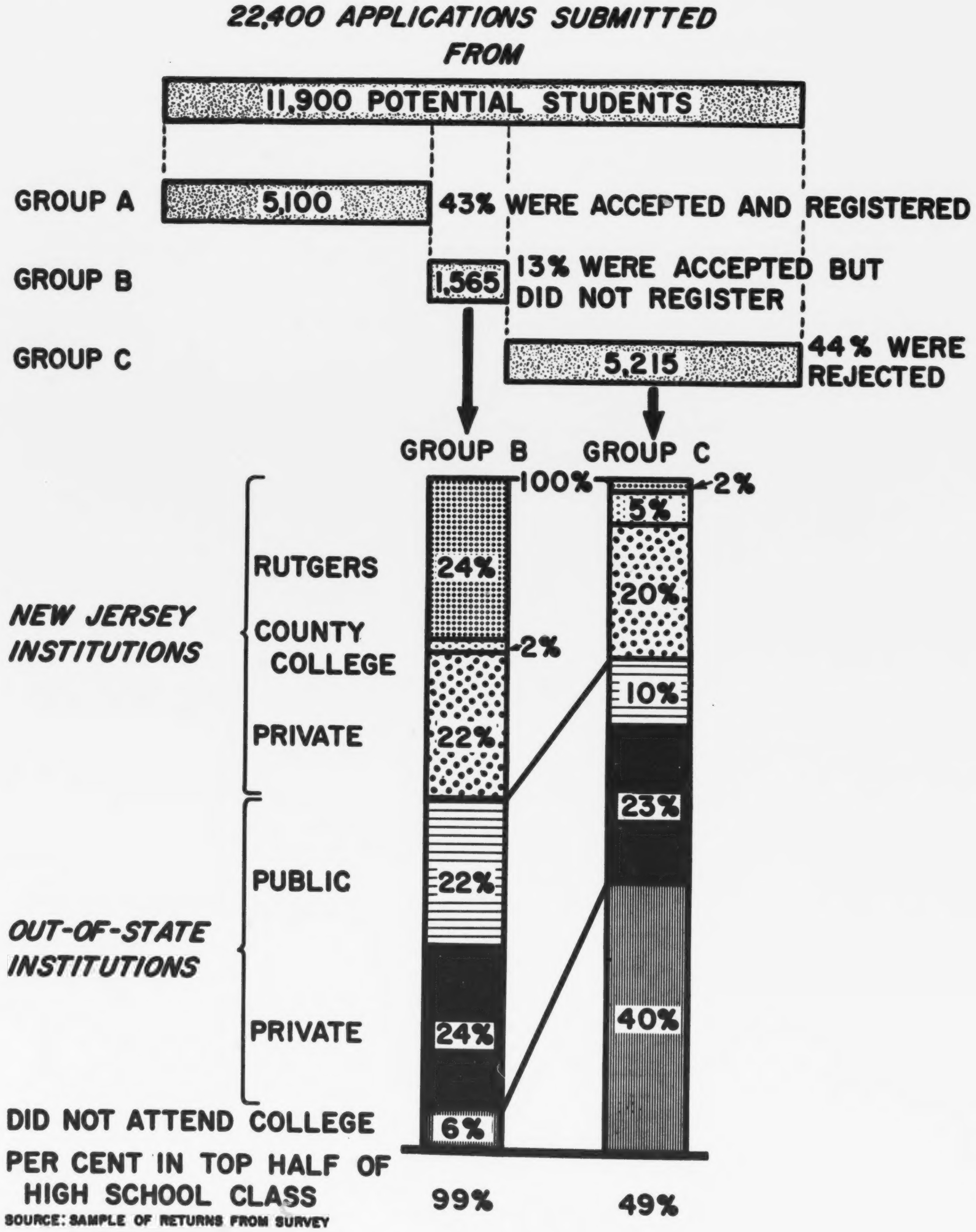
It should be borne in mind that these students rejected by Rutgers were above average in ability. A national sample of high school seniors who entered college in their first year after graduation had a mean Scholastic Aptitude Test-verbal score of 440. Of this group, the ones who completed one year of college in good standing had a mean S. A. T.-verbal score of 468. Of the qualified but rejected Rutgers applicants who responded to the survey, the mean S. A. T.-verbal score was 488.

The study did not cover the more than 4,000 students who were not accepted by Rutgers because they fell below the standards of ability outlined.

In summary, the study shows that rejection by Rutgers of qualified students did not result in many students being denied a college education, but it indicated that a great many students were forced to enter institutions where costs were higher.

Exhibit F-1

ANALYSIS OF APPLICATIONS TO THE SIX NEW JERSEY STATE COLLEGES
1966



SOURCE: SAMPLE OF RETURNS FROM SURVEY BY STATE DEPARTMENT OF EDUCATION